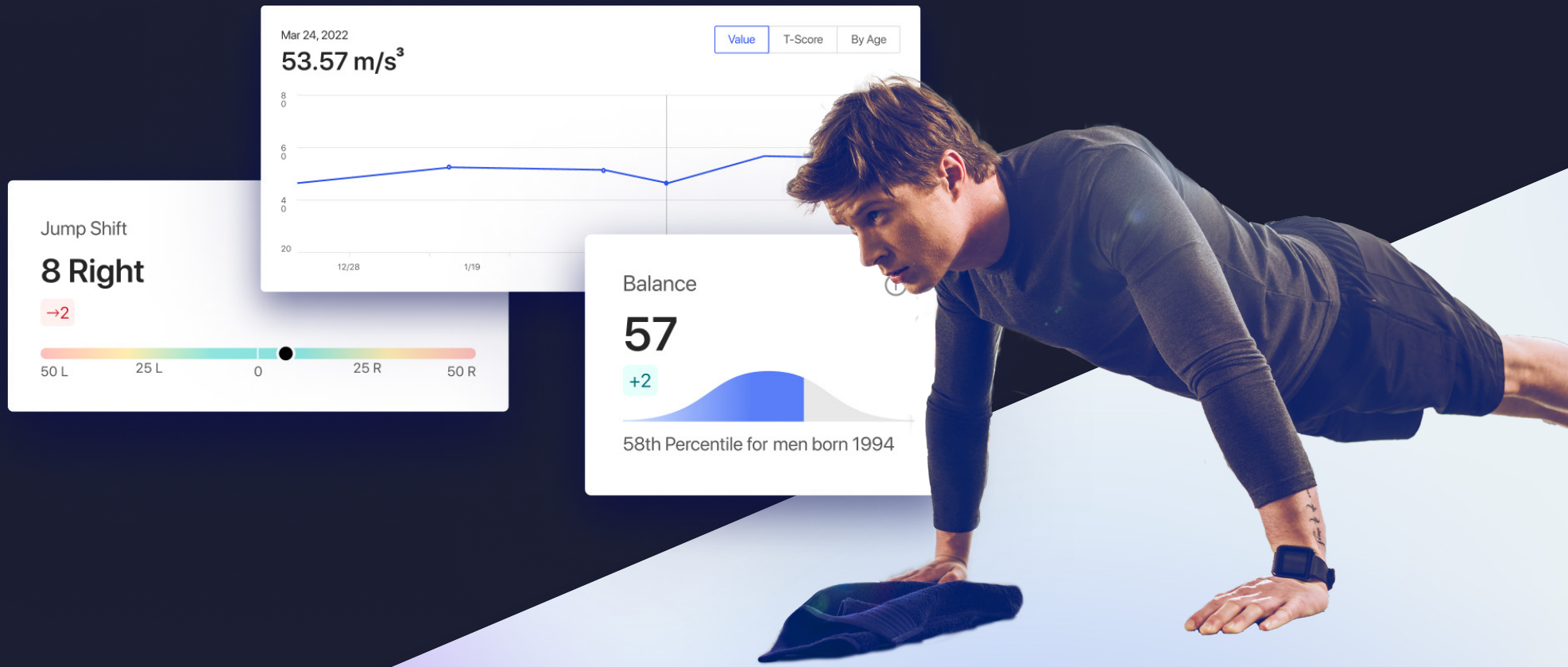
SPARTASCIENCE

5 Key Considerations for Movement Health Solutions



Introduction

Movement Health remains top of mind for sports teams, healthcare companies, military groups, and other organizations of all levels and sizes. The impact of Movement Health on individual performance, availability, and productivity has a quantifiable effect on the broader success of these organizations. A growing industry of digital Movement Health products and companies has emerged to provide these organizations with technology-based tools and solutions. These Movement Health solutions can assess and monitor human movement in new and amazing ways and are aimed at addressing Movement Health related problems such as high injury or re-injury rates and absenteeism.

There are many innovative technologies, new interventions, and capable experts within the industry. Despite this, many "solutions" still fail. It isn't uncommon for an organization to find and implement a solution only to see injury or surgery rates unchanged.

This isn't necessarily false information; rather, not all solutions are a true answer for all problems and all organizations. Why would a solution be successful for one group and not another? Why would one organization tout a solution as the answer they've been looking for when that same solution falls flat for others?

In order to answer this, we've accumulated expertise and insider knowledge from a variety of domains. This knowledge, combined with the experiences implementing technology with over 200 organizations, has allowed our team to identify some key considerations that enable solutions to succeed. Sparta Science is here to provide helpful frameworks and practical tools to utilize when attempting to address Movement Health related problems – small to large, iteratively, and at scale.

This isn't a buyer's guide focused on comparing features of comparable solutions; this is a different approach for strategic leaders and innovative practitioners who want to progress beyond the current status quo.

This resource will be zooming out to understand better what criteria you should evaluate to strategically identify a successful solution to a complex problem, whether it be a specific technology, protocol, or process.

CHAPTER 1

Identifying Your Movement Health Problem

The problems that most large-scale public health initiatives aim to solve are often abundantly clear. Let's take a cholera outbreak, for example. These outbreaks are caused by exposure to water or food contaminated with cholera bacteria, leading to severe illness and a potentially high death toll.

When dealing with Movement Health problems that aren't as well defined as a cholera outbreak, there is more room for variation and ambiguity in the specific problems we are trying to solve. The first common misstep is that organizations seek solutions before they've clearly identified, or wholly appreciated, their Movement Health problem, goals, and success criteria. How can you know the solution to a problem you haven't yet defined? This gap is not for lack of trying in many cases but typically because we may not have appreciated the relative immaturity of movement and preventative health diffusion into everyday practice.

When defining our problem, we must acknowledge that the human body is the most intricate system ever created. Each of its component parts (the nervous system, the circulatory system, the musculoskeletal system, etc.) is individually complex, and movement is an expression resulting from all of these connected parts. As is often said, "the whole is greater than the sum of its parts."

Even with this complexity, the causes and treatments for cholera outbreaks are well-researched and understood by the scientific community. Therefore, while still a complex problem, the successful intervention relies primarily on a solid understanding of the social and environmental context in which the outbreak occurs. Meanwhile, the causes and treatments for most Movement Health-related ailments such as MSK injury and pain or movement dysfunction are a topic of much debate.

Impairments related to Movement Health are much more challenging to diagnose objectively and, instead of a simple identifiable cause like bacteria, result from various complex factors. Though these problems aren't as urgently life-threatening as a cholera outbreak, the challenges presented in solving Movement Health problems require some unique considerations.

First, Review Your Context and Identify the Real Problem

No matter the setting, be it Defense, Athletics, or Healthcare, we are all ultimately judged on our results and outcomes. A challenge facing applied and tactically focused settings and traditional research and development is the ability to deliver outcomes in constantly changing environments. In other words, the real world is constantly evolving, so your solution must account for this.

Today's top solutions attempt to impact Movement Health's highly complex and iteratively adaptive areas. Rather than put a changing real-world environment in the "too hard" basket, we should aim to understand better and set appropriate expectations, but also embrace the challenge of improving real-world outcomes.

With this in place, your organization can build a system that allows you to both learn and make iterative progress. Expecting dramatic real-world results in a short period leads only to wasted money, unmet promises, and disappointment.

Set Your Real-World Goal

Once you've established which problem(s) your organization is looking to solve, you can move on to identifying the actual goal. This goal is your "lagging indicator" and your true measure of success or failure. In our example of a large-scale public health issue like a cholera outbreak, the glaring problem is the death toll. A solution ultimately needs to save lives.

Examples of Real-World Movement Health Problems

One must look at real-world challenges and the surrounding context to find a real-world solution. They are the things that matter and either contribute to or detract from your organization's overarching goals. A few include:

As you review the list above, you may recognize some of these as familiar within your situation or think of others that are top of mind. Remember, your problems are precisely that – your problems.

Identify Your Baselines

You can't set a goal without knowing where you are now. For this reason, you need to make sure you know what your baseline is. It is incredibly common for people to say they want to increase deployability, decrease time lost to injury, or increase performance test measures – yet they don't know where they currently stand on those metrics. This could be because they simply aren't measuring or they don't have access to the information they need.

Let's say you want to decrease time lost to injury for a collegiate soccer program.

It is also essential to make sure your goal is realistic, given the context. Depending upon your baseline data, it may be realistic to reduce either the number of players injured or the number of games they miss due to injury by perhaps 10-20%, but not 50-60%.

Ideally, baselines are established over time (longitudinal) and may evolve with new data and changing environments. Where longitudinal baselines are unavailable from your own data, using normative data from similar environments may be helpful while you build your own. This allows us to set more realistic goals given the context.

Establish Leading Indicators

Once you have clearly defined the real-world problem and know where you are now and where you want to go, the next step is to monitor yourself along the way. While you can't expect to solve complex problems overnight, you don't want to check back in a year and find no progress has been made. Organizations need to understand if they are on the right track so they can adjust course if needed.

Industry experts suggest establishing frequent and appropriate Leading Key Performance Indicators (KPIs).

These KPIs should reflect what you believe will get you to where you want to be (your Lagging Indicator). In order to do so, we encourage you to lean on the implementation science best practices discussed in later chapters to set these KPIs and ensure that the solution you are proposing is on a path toward being effective in your organization.

CHAPTER 2

Understanding Your Environment & Failure Points

Every region that is affected by cholera outbreaks varies dramatically. Exposure routes in different regions may be driven by torrential rainfall leading to frequent flooding, a lack of adequate water and sanitation infrastructure, or particular social and cultural practices. While their problem is the same, designing an efficacious solution requires an understanding of the unique environment and its potential complications.

Your organization is like no other, even compared to those of similar industries and sizes. Therefore, your challenges and eventual solutions are unique to you as well. The next primary consideration is the full context of your organization.

It is imperative to remember that Movement Health issues are incredibly complex, as are organizational dynamics. One organization within the Department of Defense may have 3,000 service members with only one practitioner. In contrast, another group may have 300 members with a team of 10 dedicated experts working to optimize performance and recovery.

This could be said for any human-centered, real-world health and performance outcome measure. Rather than hiding behind this complexity, recognizing and embracing this is an important first step.

1. **How many staff members do you have?**
2. **Who are they?**
3. **How large of a team or group do you need to monitor?**
4. **What MSK injuries are they more or less likely to experience?**
5. **How varied are the demands of your team or group?**

You're probably dealing with a complex system if your results and outcomes are impacted by constantly evolving and interrelated factors.

Don't let the complexity scare you, but you also can't ignore it. Almost every key aspect of failure in implementation in any industry can be traced to a poor understanding or interpretation of the contextual environment in which you want to operate. Many things "work" in a vacuum but fail when put to the test in the real world. In order to better understand this, let's discuss the difference between efficacy and effectiveness.

Efficacy vs. Effectiveness

In order to understand why a solution would work in one environment and not another, one must know the difference between efficacy and effectiveness. The key differences explain the chasm between what works in theory and what will truly work for your organization after implementation.

Efficacy can be defined as the performance of an intervention under ideal and controlled circumstances.

Effectiveness refers to its performance under 'real-world' conditions.

In nearly every case, when someone tells you something works, it is because it has for them. The problem arises when different environments introduce new potential failure points.

Let's think about baking a cake. The box has instructions and ingredients listed, all of which make a delicious chocolate cake in their lab. What happens if you live in Denver and are baking at a very high altitude? What if you are lactose intolerant and use soy milk rather than dairy milk? What if your oven is 20 years old and doesn't heat up as hot as it used to? In all of these situations, your cake won't turn out perfectly. Does that mean the cake company lied? Of course not; you simply haven't adjusted your recipe to account for the difference between their lab and your kitchen.

This is the difference between efficacy and effectiveness.

Implementation Science

By simple definition, Implementation Science is "The scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices (EBPs) into routine practice."

It focuses on strategies' effectiveness rather than interventions or evidence-based practices. Implementation Science addresses the context in which methods are applied (e.g., the potential failure points) to understand how that influences the strategies' effectiveness. Effectiveness is easily quantified through our KPIs, with our Lagging Indicator usually being the most straightforward measure of effectiveness.

While implementation science has been a staple in other domains for years, it has largely been ignored in the literature related to Movement Health.

Thankfully, this is changing. Some recent articles published on injury and performance interventions take into account strategically evaluating interventions and technology solutions.

Remember, there is no single best method; there is a whole science to this. It's not Implementation Law but rather Implementation Science. Evaluating solutions (technology, software, and systems) is a multifaceted process encompassing a critical analysis of your organization's problem, environment, failure points, and goals.

Questions to Ask Yourself

As you begin the process, there are quite a few considerations to keep in mind.

A great way to operationally integrate this process is to form a **"Steering Group,"** where you bring people together to incorporate their expertise into developing an aligned understanding of the context and problem.

Ask yourself a few contextual questions that can help you understand your organization in ways that will inform future implementation. This is a non-exhaustive list. Here are examples of things to consider that tangibly affect the logistics of your implementation.

Practical Considerations

Organization Size
"How large or small is my organization?"

Staffing Ratios
"How large or small is my team compared to the athletes or individuals we help?"

Number of Locations
"Does this solution need to be used in multiple locations or one place?"

Time Considerations
"How many opportunities to assess individuals will we realistically have? How often can this be done?"

Data Security / Privacy
"How does my organization handle PII?"
"How does my organization handle PHI?"
"Are there rules or regulations we need to comply with, like HIPAA?"

Stakeholder Considerations

Leadership

- “Who needs to buy-in to this solution?”
- “Do they support the project?”
- “Will they enforce compliance?”
- “Will they allocate time and resources to support its success?”
- “Will the leadership team want check-ins? If so, how often?”
- “What is their education level?”
- “Will they understand it?”

End User

- “What type of end-user needs to buy into this solution?”
- “How much free time do or will they have?”
- “Will their buy-in affect their outcomes?”
- “Is it necessary that they understand their results?”
- “Do they need access to their results?”

Movement Health SMEs/Practitioners

- “How will this solution be perceived across the entire group of subject matter experts?”
- “Does this solution need to be implemented similarly across experts in order to be effective?”
- “What depth of information or data is required for these experts?”
- “What additional training or education is required for these experts?”

Tertiary Stakeholders

- “Is Legal, Compliance, IT, Finance, or any other departmental stakeholder going to want a say in which solution is implemented?”

CHAPTER 3

Establish Your Criteria Using an Implementation Framework

Once you have the questions above answered, the next step is establishing a framework for implementation. It may be tempting to jump ahead to choose a solution at this stage, but utilizing an established framework is critical to developing the right criteria for your solution.

Remember that a strategic and systematic approach (founded in Implementation Science) needs to be central to the conversation regardless of the industry your organization serves and your stakeholders in finding a solution.

What will truly work for your organization, and who will get to decide whether it is working or not? Impacting Movement Health is all about effectiveness, and choosing a solution based on efficacy alone may leave you researching a new solution before you know it.

An essential part of Implementation Science is establishing an evaluation framework. It is a useful exercise to begin here when developing criteria for the solution. There are a few foundational concepts that underlie all process models. **Keep in mind:**

01 Commit to a Systematic Approach

It is essential to do things repeatedly to understand what works and doesn't. Your implementation efforts can't be random or ad hoc. Given the same criteria, one should come to the same decision to determine the result of that decision.

It takes discipline to create and use a systematic approach. While gut instincts should play a role in the creation of the system, these instincts cannot alter the course on the fly. In the end, the payoff comes when you know for sure whether an option is successful or not.

02 Have Trust in an Iterative Approach

The solution must be iterative. You can't do it all at once, so don't expect outcomes immediately after implementation.

When it comes to true solutions, something that will meet your goals in the long term, there's no magic bullet. Movement Health solutions take time to show their success. Look to your leading indicators to make sure you're on the right track along the way.

03 Stick to the Methods You Settled on

Compliance is the most important thing to keep in mind at the beginning. All individuals involved – from the Movement Health practitioner administering the technology to the patient or athlete being assessed, to the individual responsible for distributing the monthly report to stakeholders – must adhere to the guidelines.

Different compliance metrics can be great leading KPIs to help consistently monitor compliance and hold stakeholders accountable. An exceptional theoretical system or plan will still fail in the real world if each stakeholder isn't held accountable to comply with the methods and plan.

Evaluation Framework

Thankfully, several evaluation frameworks have already been established and shown to produce valuable feedback. One we encourage you to consider is RE-AIM (Reach, Effectiveness, Adoption, Implementation, Maintenance). The RE-AIM dimensions (explained below) can be applied to multiple levels, including the individual, clinic or organization, and community levels, enabling you to plan and evaluate your solution from a holistic and ecological perspective.

The purpose of the RE-AIM framework and others like it is to help provide evidence-based guidance to:

A) **The logical organization**

B) **The systematic planning and evaluation of the information from Chapters 1 and 2.**

However, the key to using frameworks like RE-AIM is less about the formulaic repurposing of definitions and more as a guide to developing your own operational and context-specific strategies. You can read more about an operational example of the RE-AIM Framework in this BMC Public Health article.

With this in mind, the following provides an 'operationalized example' of applying the key definitions and concepts from the original RE-AIM framework to that of a Movement Health solution.

Example Evaluation Framework

	Dimension	Operational Definition	Considerations
REACH	Who is participating and why?	The absolute number, proportion, and representativeness of all relevant stakeholders who are willing to participate in a given solution.	• Who do you plan to reach in your initiative? • Who will benefit? • How or where will you reach them? • Who needs to approve these methods? • How will you know if the initiative reached the intended audience and who participated?
EFFECTIVENESS	What are the outcome measures?	The impact of an intervention on important outcomes, including potential negative effects, quality of life, and economic outcomes.	• What are the most important outcomes you expect to see (lagging indicator)? • Who will care about these? • How will you measure these changes? • How likely is it that your initiative will achieve its key outcomes? • What has gone wrong with similar initiatives in the past?
ADOPTION	Who will agree to deliver and start the solution?	The absolute number, proportion, and representativeness of all relevant stakeholders 'Reached' that agree to deliver or begin your solution (a measure of engagement success).	• What metric/milestone determines when someone moves from Reach to Adoption? • What are the key characteristics of those targeted? • What are the characteristics of people or settings who do not want to participate in the solution? • What external or environmental supports or threats are there? • Who will actually do the work and do they have the skills and time to do so?

	Dimension	Operational Definition	Considerations
 **IMPLEMENTATION**	Was the solution implemented as intended?	The absolute number, proportion, and representativeness of all relevant stakeholders 'Reached' that implemented your solution as intended (a measure of onboarding success). E.g., At the setting level, implementation refers to whether stakeholders (staff) successfully completed protocols and the time and cost of the intervention. At the individual level, implementation refers to people's use of the intervention strategies.	• What metric/milestone determines when a stakeholder moves from Adoption to Implementation? • How will the solution be delivered? • What are the key elements of the solution that must be delivered to be successful? • How will you measure this data? • What costs (including time and effort, not just financial) need to be considered?
 **MAINTENANCE**	Was the solution and effect maintained as intended?	The absolute number, proportion, and representativeness of all relevant stakeholders 'Reached' that maintained/ sustained your solution and effects as intended (a measure of onboarding and management success). E.g., Can be considered as the extent to which a solution becomes institutionalized or part of the routine organizational practices and policies.	• What metric/milestone determines if someone moves from Implementation to Maintenance? • What infrastructure will be needed to sustain the initiative? • Can you sustain the initiative over time? • Will the needed infrastructure and funding remain? • How can you track the major changes made over time?

Operationally adapted from the resources found at www.re-aim.org. You can find many other templates and interactive resources here.

A key operational difference in this example compared to the standard framework is that all dimensions are compared as a proportion of Reach and include all relevant stakeholders. This is so differences between dimensions can be identified more clearly, and the maturity of the solution's impact can be assessed. For example, Adoption is a proportion of the overall solution Reach rather than a separate dimension altogether. To understand the operational adaptation of RE-AIM in more detail, please view this article in the Journal of Clinical and Translational Science.

REACH

This is the criteria to ensure the right people can access the solution.

When evaluating reach, all stakeholders should be considered.

- Individuals (Athletes, Warfighters, Soldiers, Employees, Patients)
- Practitioners (Physical Therapists, Strength and Conditioning Coaches, Athletic Trainers, Nurse Practitioners)
- Leadership (Commanding Officers, Head Coaches, Regional VPs)

ADOPTION

It is essential to track the level of adoption as a leading indicator, meaning the percentage of the reach you intend to achieve, given your goals and organizational limitations.

Remember, there may be a vast disparity in education and understanding between your staff fostering the solution and your end user. There can also be a big difference in the training and capacity between two staff members.

These differences account for a large portion of the discrepancy you'll find in your reach vs. adoption of the solution. Your reach is the percentage and characteristics of individuals receiving the new process, program, or technology. On the other hand, your adoption is the percentage of people who actually use it. Even if you offer an answer, the end user may not want to or understand how to adopt it.

EFFECTIVENESS

You want to measure the real-world effectiveness of the policy, procedure, or technology, given your goals and organizational limitations.

Individual-level outcomes could be more physical activity and better quality of life for a senior citizen, less absenteeism for a soldier, and fewer games missed for an athlete. Yet, this is only the beginning. You may start with less absenteeism, but how is that measured? How do you get access to that information? Who benefits from this, and who needs to know about the results?

IMPLEMENTATION

Implementation refers to the consistency and cost of delivering a new process, product, or technology. If not correctly implemented, no option will seem like a good fix for your problems!

An important consideration for the implementation dimension is that you may start with a view based on the evidence and experience as to how this solution should be implemented (implemented as intended), but this may have to evolve as you learn and gain insight from the RE-AIM framework. This framework can help us to avoid the familiar goldilocks principle; your intended implementation being too much too soon or too little too late. This is why an iterative mindset and approach are so important.

MAINTENANCE

Because this isn't a "one and done" thing, you will need to plan for some type of maintenance plan.

Remember to keep in mind changing staff, reduced intensity, seasonality, and different settings may change the outcome of your implementation over time. You'll need to account for this in determining where your chosen solution is or is not still considered a success.

Create criteria based on your organizational needs to evaluate the solutions you are considering. Formalize your criteria by documenting and creating scorecards for your solution evaluations. For example, after going through the RE-AIM framework, you may decide it is essential for the solution that fits your organization to reach your intended audience and compliance goals, and you need ten systems across five locations. It may also be imperative to your organizational success that leadership is able to log in at all times and check in on progress, so a criterion may be multi-layer reporting capabilities.

CHAPTER 4

Implementation Roll Out Models

Once you have organized, planned, and decided on an approach to evaluating your solution, it is best practice to use an implementation 'roll out' model. There are several different models to pull from, each of which has proven successful in various real-world settings. If there is a technology or intervention you want to implement, we recommend learning from the strategies used here:

The Stetler Model

The Stetler Model enables practitioners to assess how research findings and other pertinent evidence embed in clinical practice. The model examines how to use evidence to create change that fosters patient-centered care.

There are five phases in the Stetler Model, which you can learn about in detail in this publication. **They are:**

Phase I: Preparation

Phase II: Validation

Phase III: Comparative Evaluation/Decision Making

Phase IV: Translation/Application

Phase V: Evaluation

Each phase is designed to facilitate critical thinking regarding the practical application of research findings, resulting in the use of evidence in the context of daily practice and mitigating as many human errors made in decision-making as possible.

The ACE Star Model of Knowledge Transformation

The ACE Star Model emphasizes crucial steps to convert one form of knowledge to the next and incorporate the best research evidence with clinical expertise and patient preferences, thereby achieving evidence-based practice (EBP). EBP aims to hardwire current knowledge into common care decisions to improve care processes and patient outcomes. It holds great promise for producing the intended health outcomes.

The Knowledge-to-Action (KTA) Framework

The KTA Framework is used to facilitate the use of research knowledge by several stakeholders, such as practitioners, policymakers, patients, and the public. This makes it ideal for large organizations that may need both leadership and IT to get on board with the same solution. It has two components: Knowledge Creation and an Action Cycle, each comprising multiple phases.

The Iowa Model

This model was developed to serve as a guide for nurses to use research findings to help improve patient care. The Iowa Model was created as a pathway or method to EBP to guide the steps to help identify issues, research solutions, and implement changes.

The Ottawa Model

The Ottawa Model of Research follows a six-step approach to guide the implementation of an innovation. **They are:**

1. Set the Stage
2. Specify the Innovation
3. Assess the Innovation, Potential Adopters, and the Environment for Barriers and Facilitators
4. Select and Monitor the Knowledge Translation Strategies
5. Monitor Innovation Adoption
6. Evaluate Outcomes of the Innovation

The common thread amongst all of the models and frameworks mentioned in the previous chapter is that these processes are iterative; they get better over time. If you want to effect real change and solve complex problems, this is what is required.

If you continue to stop and start new processes every year or two, your organization will never observe the outcomes you're looking for. This is why we encourage you to take your time in making a decision that your organization will keep in place and benefit from for the long term.

CHAPTER 5

Protecting Your Investment

The chosen solution needs to be the anchor for your organization, no matter who comes in or out of your team. If technologies are treated like the latest clothing trends, changing from season to season, nothing will be effective, and you'll be left starting from square one over and over again.

Effecting change across your organization can be challenging. Maintaining a complex solution in a changing environment is a hurdle you'll likely need to face at some point. As staff members come and go, will the next person change the course? Your lagging indicator should continue to guide you as these tough decisions arise. What is best for the athlete, warfighter, or patient?

On average, it takes 17 years for EBPs to leave the lab and be presented as a real-world solution. Why is this? Because it takes time to get a perfect process. Running out of budget or focus halfway through the implementation process can lead to failure in what would have otherwise been a success.

A stark reality is that the value and outcomes generated through any Movement Health solution also rely on many other factors. Beyond the technology or process you chose, you need everyone involved to actively participate.

For this reason, one must put considerations in place to protect the long-term efforts of the solution before even starting on the path to reaching your end goal.

While change is imminent to complex systems like health and performance, this does not mean your organization can't find success and keep the focus on your end goals.

CHAPTER 6

Final Thoughts

It is easy to feel overwhelmed at the thought of making true organizational change for the better. Yet, Movement Health solutions make it possible to do so, no matter how large or small your organization is and who you serve. That being said, some serious dedication and patience need to be put in place before moving forward with a solution. Identify your Movement Health problem, understand your environment, and then put a framework in place to implement your chosen solution – protecting your investment along the way from those who may want to deviate from the agreed-upon plan.

Armed with all this information, we encourage you to browse our website to learn more about the solutions offered by Sparta Science. Sparta Science is a Movement Health Intelligence Company applying modern data science techniques that advance industry best practices and optimize how organizations assess, understand, and improve health & well-being. The Sparta Movement Health Platform (SMHP) enables organizations to quickly assess users' movement at scale, presents meaningful, differentiated biomarkers, and delivers engaging Movement Health Intelligence with operational relevance for all stakeholders.

The Sparta Movement Health Platform has applications in Movement Health classification, rehabilitation, performance, and research spanning athletics, military industries, and healthcare organizations. We invite you to take the foundational steps in understanding your organization's unique needs as outlined in this E-Book and consider if Sparta Science is part of a pragmatic solution to your Movement Health needs.

Get your demo