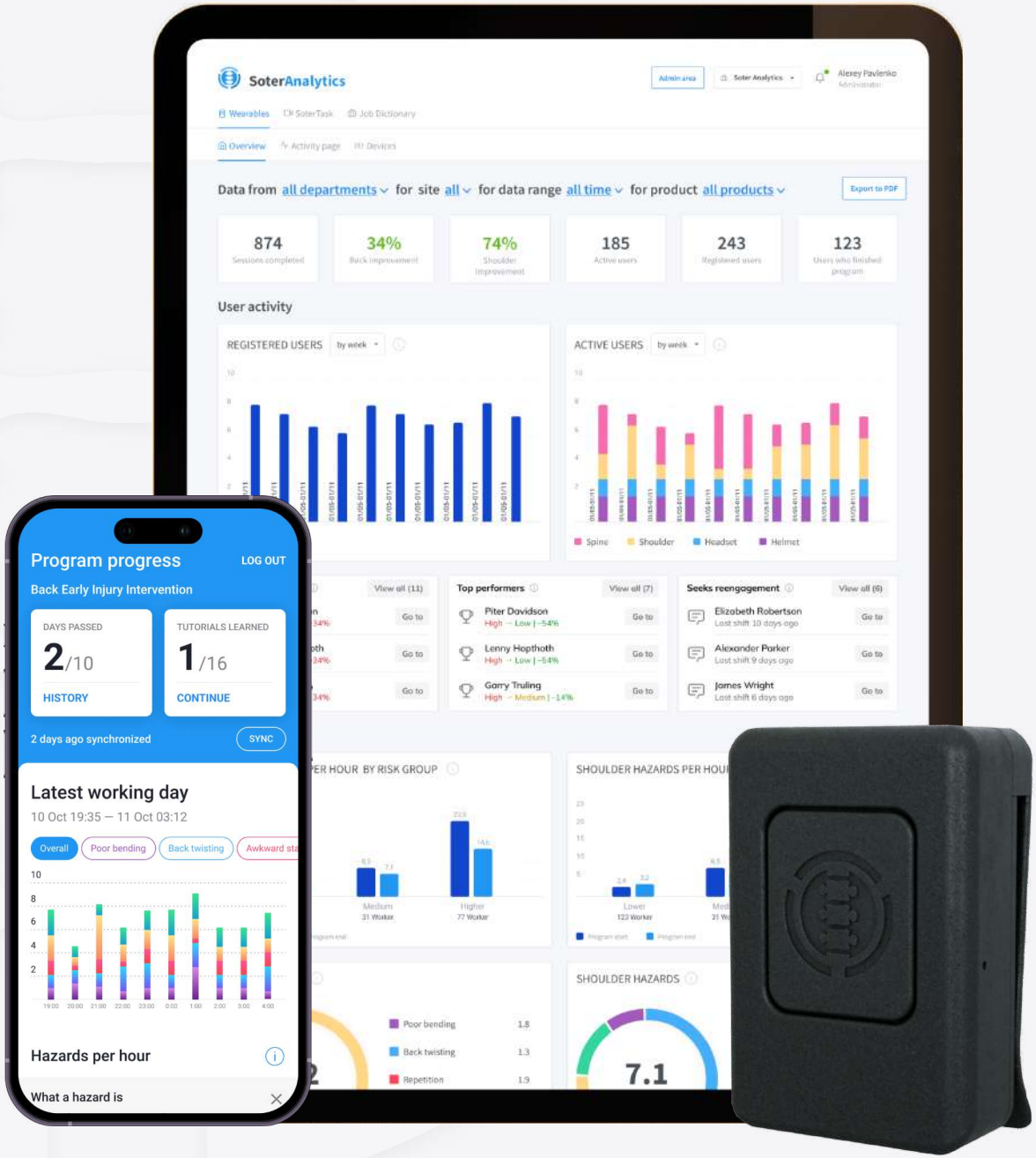
Soter Analytics

SoterCoach Explained

What is SoterCoach and How Does it Compare to Traditional Manual Handling Training?



Preventing People From Breaking

www.soteranalytics.com

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What is SoterCoach?

SoterCoach is the first wearable solution & training program that uses AI to improve an individual's ergonomic safety:

Measuring risk for both back and shoulder, it delivers personalized coaching to workers using a wearable device and provides recommendations via a mobile companion App and management dashboard. The solution has been proven and the typical worker improves their ergonomic safety by reducing the hazardous movements they make by between 30-70%.

Soter Device

The Soter device is a lightweight wearable solution that monitors and understands an individual's risk of injury:

- Measures and monitors 10 at-risk back and shoulder movements in real-time
- Provides audio and haptic real-time feedback to the worker
- Works independently from the phone in the workplace
- Fits any body type
- 30+ day battery life

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Personalized Training And Insight

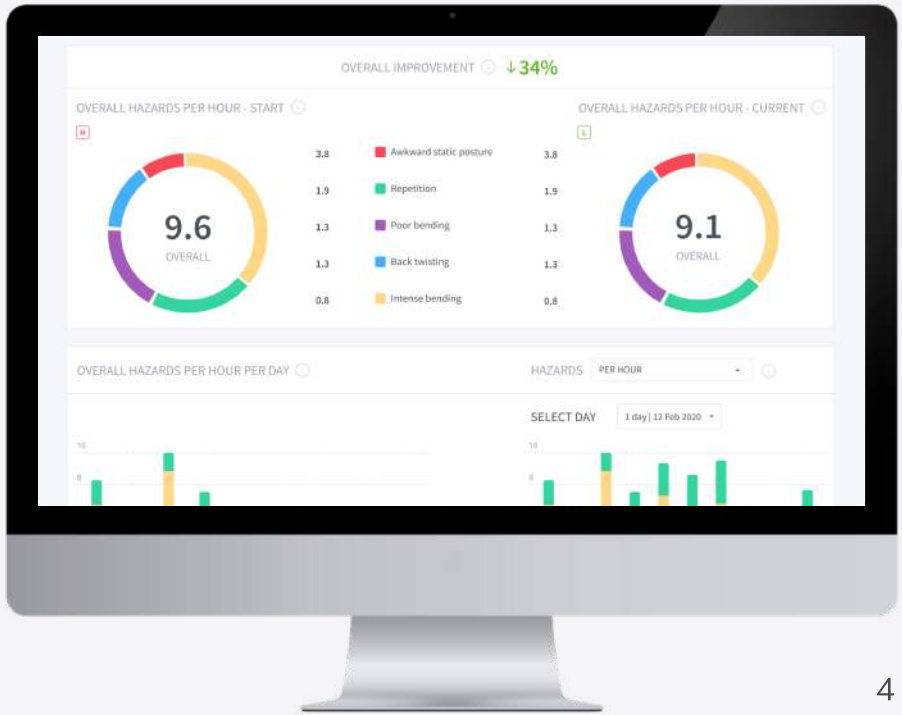
Training, personalized to the individual's actual movements and injury risk, is delivered via the Soter device and companion App:

- 20-day personalized training program including micro-learning manual handling tutorials via the App
- Haptic and audible feedback from the device given in real-time to assist behavioural change and self-correction
- Important movement data visually represented on the App for self-reflection
- Worker is in control of their own learning experience
- Worker does not need a phone in the workplace (coaching is delivered daily either on a phone or a communal tablet)

Analytics Dashboard

The Dashboard is the link between the workers using SoterCoach and the organization, providing managers with a complete state of progress

- Immediate data access
- View and manage the progress of workers
- Align tasks with hazardous movements
- Visualize objective risk data to analyze and reduce workplace risk through redesign of processes, job tasks, equipment and training



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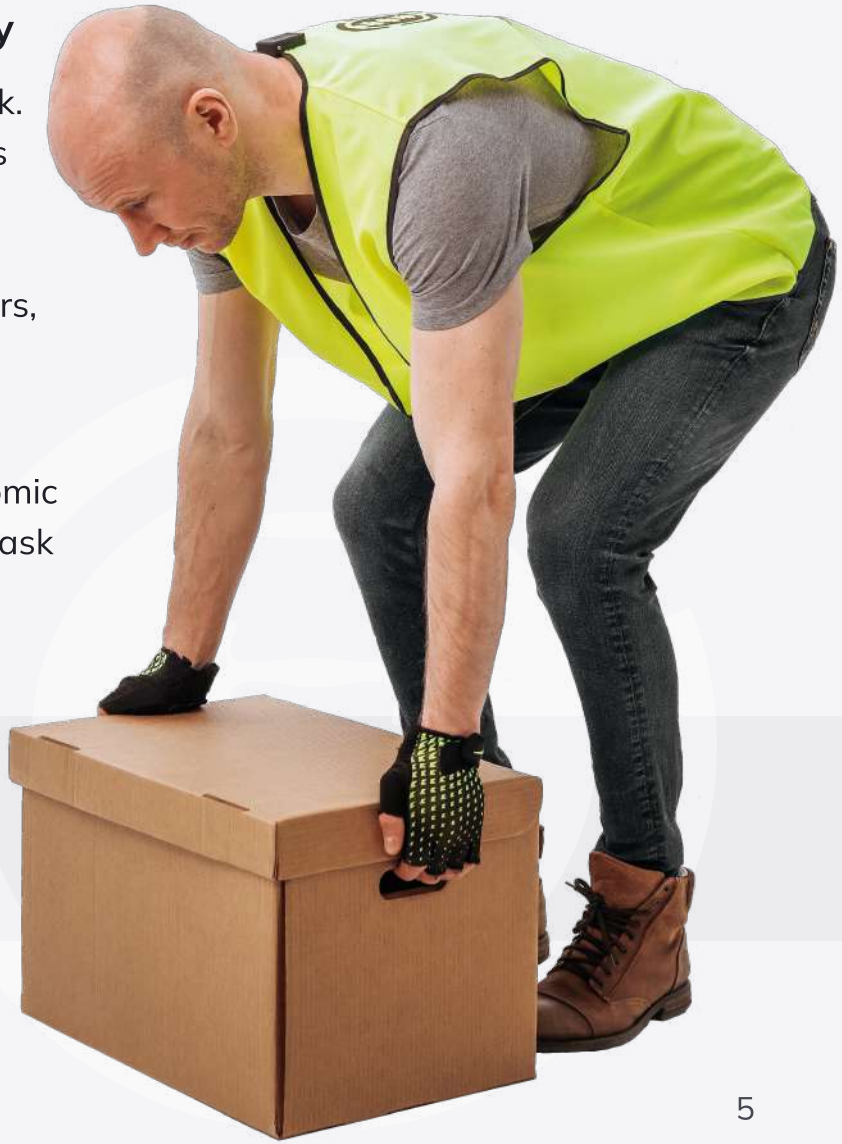
The Problem Explained

Workplace injuries cost the individual, the organization and society

Workers in many industries and occupations can be exposed to hazards at work. Hazards leading to musculoskeletal disorders (MSDs) can arise from risk factors such as pushing and pulling heavy loads, lifting items which are heavy, bending and twisting, working in awkward body postures, holding static postures, and carrying out repetitive tasks. If a worker has exposure to these known risk factors, the chance of injury increases.

Employers are responsible for providing a safe workplace for their workers. The number of MSDs resulting can be substantially reduced by applying ergonomic principles. Ergonomics can be applied to adapt to the worker's environment or task to help them to move naturally, rather than straining to overcome obstacles. This, in turn, reduces the biomechanical strain on the body.



By gaining real, data-driven and objective insight into the way a worker moves, the biomechanical obstacles they need to strain to overcome can be identified.

Identifying this can be relayed to the worker in the form of training to optimize their technique. This then can also be fed back to the organization to identify areas for improvement so that the task can be fitted to the worker.

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The following are the highest industries of concern according to the Bureau of Labor Statistics:

- Retail
- Warehousing
- Manufacturing
- Transportation
- Healthcare & Social Assistance

MSDs are among the most widely spread occupational problems in industries and services, with increasing expenses of salary compensation and health costs, declining productivity and lower quality of life.

In 2021, MSDs were the most frequently reported causes of lost or restricted work time, with 33.5% of all worker injury cases due to:

- Overexertion involving outside sources (handling objects)
- Other exertions or bodily reactions (awkward postures)
- Repetitive motions involving microtasks

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Safety Ratios

Safety can be defined as the freedom from harm or the freedom from unacceptable risk. Ergonomic assessment of Work-Related Musculoskeletal Disorders (WMSDs) is an evaluation of risk and ergonomic risks are not well-understood due to the large variation in parts and tasks. These disorders are caused by different risk factors' interactions resulting from several factors, which can be categorized into individual, psychosocial and physical factors

From Heinrichs's original risk ratios to Bird's pyramid of risks, we have sought to properly understand incidents, and populate downstream data within the pyramid prior to producing effective interventions, thus ergonomics interventions have primarily been reactive.

With decades of data, we can now affect the bottom of the pyramid and influence the upstream cascade.

Many jobs are in a high-risk category based on postural assessments or task type and reducing unfavorable biomechanics, the upstream value is to reduce at-risk behaviors which should, in turn, lead to less MSD's, narrowing the ratios in the pyramid.

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Traditional Manual Handling Training

There is a considerable evidence base supporting the idea that the principles learned during training are not applied in the working environment and a systematic review found that manual handling training is largely ineffective in reducing back pain and back injury.

Traditional training also fails to address the compounding factors of lifting technique, posture, task repetition and intensity, which most often lead to LBP onset and MSDs, rather than a singular instance of poor manual handling.

Equally, traditional standards specify what ‘typical’ humans can withstand. In the case of ergonomics and manual handling risk, these usually estimate how many higher-risk movements a person should make within a time period and how much weight or force a person should be able to safely withstand.

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Manual handling standards are based on statistical averages and anthropometric data which do not withstand the immense population variety observed in today's society.

Furthermore, risks are varied by areas. Providing interventions to enhance area-specific ergonomics or personnel specific recommendations can be extensive and expensive.

In summary, despite safety science evolving continually, work-related injuries are a complex and costly problem; comprehensive interventions and training are too broad while individual solutions are too narrow in the growing workplace.

Traditional manual handling training fails to address the compounding factors of lifting technique and are too broad, and individual solutions are too narrow and expensive

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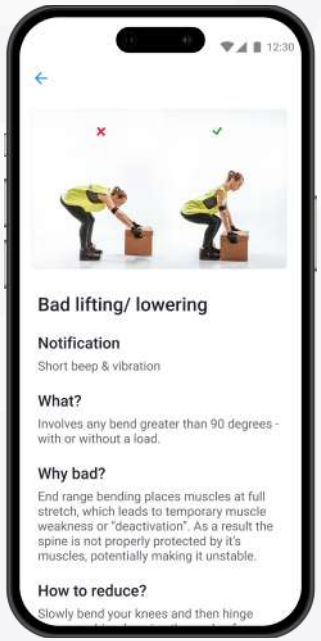
How SoterCoach Solves The Problem

SoterCoach uses biofeedback to a alert a worker to high risk risk movements while they are performing their tasks. The haptic and audible notifications provide internal learning to alter nerve pathways and is one of the most effective tools for self-correction and increasing awareness. Three main components of risk are tracked: poor technique, awkward static postures, and high intensity.

Throughout the program of SoterCoach, biofeedback risk alerts are tailored to the individual and promote proprioception, encouraging better awareness of one's movement patterns.

This is accomplished by measuring the following movements:

- Lifting movements with poor technique and overreaching (sagittal flexion)
- Back twisting (rotation of the trunk)
- High and sudden impact forces
- Sustained arm elevation
- Hazardous pushing and pulling of the shoulder
- Sustained awkward static postures (including sagittal flexion, rotation of the trunk)
- Arm elevation (with or without load)
- Shoulder overexertion
- Repetitive shoulder movements
- Repetitive back movements



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The Soter Intensity Model

Soter Analytics has built a system that self-learns and gives personalized feedback to each individual worker, helping them avoid the movements that might increase their own risk of injury. Soter has conceptualized and built an Intensity Model that measures how difficult movements are for individuals. Among many characteristics it will consider the velocity, jerkiness, and bend angle at the completion of the movement.

This is a step-change improvement from traditional standards that only estimate weights that people could safely move but completely ignore a person's inherent strength and fatigue.

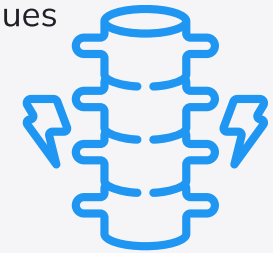
This is achieved through the three following phases:

Phase 1:

Measure the individual physical strength of each worker with our highly-innovative intensity model which identifies movement difficulty

Phase 2:

Identify when an individual or group of movements are increasing the fatigue of a worker or if they begin overcompensating with different working techniques to avoid strain



Phase 3:

System continually self-learns to calculate how the worker's risk is adjusting and provides increasingly personalized feedback to the worker through the App

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SoterCoach In Your Organization

SoterCoach: Worker Daily routine

Take device

- Log in to the App on communal tablet or personal mobile
- Take a device
- Scan the QR code on the device

Wear device

- Wear the device
- Listen to the beeps and move safe to avoid them
- Check the meaning of the beeps on the cards

Check results

- Check daily progress and any rewards earned in the App

SoterCoach: Managers

Check Progress

- Log into Soter Dashborad
- Check organization overview risks
- Check individual risks

Approach Workers

- F/up workers needing assistance
- Define interventions

Compare Progress

- Compare intervention progress
- Determine next actions

The Soter solution addresses risk in all categories from the individual task and the work environment.

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How SoterCoach Can Help Automate Ergonomic Processes

Responsibility	Description (OSHA)	Soter Contribution
Management Support	• Commitment from managers- a key to the success of the process • Clear goals and objectives should be defined & delegated • Communicated to the workforce	• Established safety program ready to roll out • Safety champions & key stakeholders delegated and trained • Managers supported through every implementation stage

Worker Involvement	• A participatory approach, workers to be included in:
	  ◦ Identifying and feeding back risks in their environment,
	  ◦ Making suggestions for changes to environment and evaluation of changes
		• The program builds worker awareness of task risks and involves them in solution discussions
		• In-App feedback and program debrief discussions empowers worker to provide feedback

Training Provision	• Training to be provided in the worker's language • Training to increase awareness of risks of manual handling and how to improve technique.	• Training can be provided in the worker's language in accordance with worker's rights • Biofeedback training- most effective method for improving biomechanical technique

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Responsibility	Description (OSHA)	Soter Contribution
Problem Identification	• Early identification of risk factors for MSDs	• Objective and unbiased identification of unsafe acts as predisposing factors for MSDs rather than waiting for a minor incident or reporting of pain
Early MSD Reporting	• Early reporting accelerates job assessment and improvement process to prevent the development of a serious injury	• SoterCoach does not rely on symptom identification, by which time an injury has already prevailed • Identification at an earlier step and quantifiable
Solution to Control Hazards	• Implement solutions to control hazards and reduce, control or eliminate workplace MSDs	• Identification of the workers at risk tasks or demographic elicits opportunity for solutions. • Streamlined objective data comparisons of before after interventions supports hazard control
Progress Evaluation	• Established evaluation and corrective action procedures are required to periodically assess the effectiveness of the ergonomic process and to ensure its continuous improvement and long-term success	• Reports generated with worker progress through one platform • Improvements quantified and verified through the collected objective data

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The Value Of SoterCoach

Reduction in:

- Workplace injuries
- Workers compensation Claims
- Indemnity costs
- Indirect costs of an injury
- Lost / restricted work days
- Injury severity
- Cost of manual handling training
- Requirement of observation/supervision of employees

Productivity Gains

- Improved operational efficiency
- Increased time on the job
- Reduction in physical fatigue
- Time to completion gains

Employee Engagement Benefits

- Improved safety culture with emphasis on worker wellness
- Enhanced employee empowerment and autonomy
- Reduction in absenteeism
- Increased retention
- Decrease in psychosocial risks

Soter provides a solution that showcases a direct investment towards the safety and wellbeing of the individual while also complementing the general work environment and the organization.

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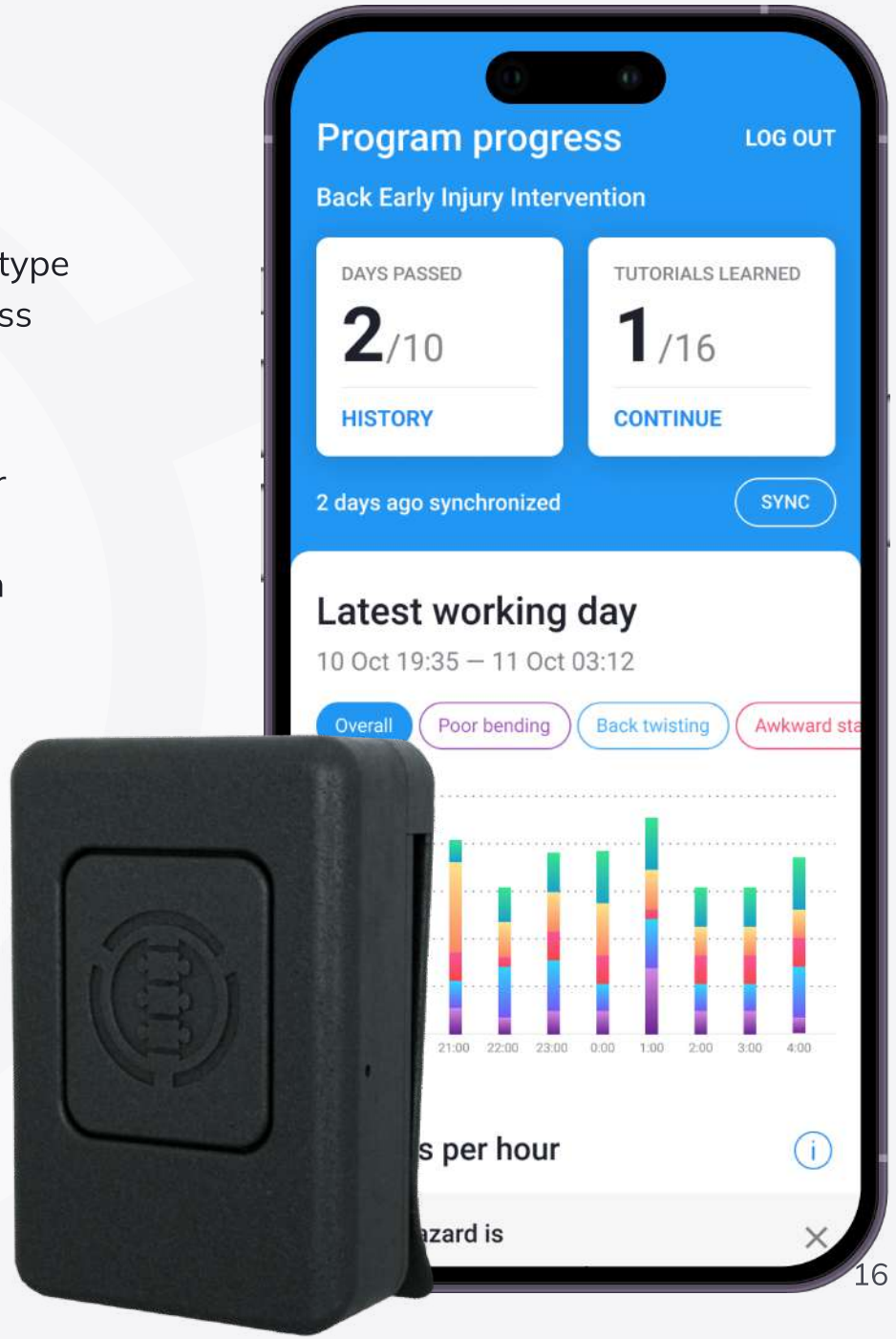
Implementing SoterCoach

Financial outcomes from prevention do not only depend on the type of intervention program, but more on the implementation process of the intervention.

With over 5 years delivering safety technology in industry, Soter has created an **effective standardized deployment strategy** accomplishing a minimally invasive, easy to implement program with guaranteed multi-level results from the individual worker through to upper management.

Soter delivers an intervention which incorporates various levels of workers in an organization with minimal interference in current work output and productivity but cultivates engagement at all levels.



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SoterCoach vs Traditional Manual Handling Training

Soter provides an ergonomic solution which boasts accuracy above that of other observational techniques.

Ergonomic Intervention	Description	SoterCoach Value
Traditional manual handling training	½ - 1 day loss of productivity (Classroom) Emphasis on theory General guidelines Little consideration for anthropometric variability	On-the-job training (no loss in productivity) Habit-forming biofeedback enhancing behavioral change & self-reflection Personalized and self-paced coaching Considers individuals stature, strength, fatigue Non-gender bias recommendations Identifies, categorizes, and monitors high-risk employees, tasks, roles and departments Multi-site evaluation, scalable Multi employee evaluation Quantitative data and objective assessment driven workplace insight Proactive initiative, true early intervention
Personalized manual handling training	Bespoke training for tasks or individuals Requires reinforcement and supervision to ensure standards Narrow reach for an organization with diverse tasks, roles, and locations	
Ergonomist site visit and observation task risk assessment	Human observation subjective and narrow Human behaviour tends to change while observed Limited perception of intensity and repetition	
Accident investigation	Reactive intervention Open to litigation pathways	

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Wincanton

Case Study - 250 Days No Lost Time Injury

Wincanton

Wincanton utilised the SoterCoach solution which consisted of a small clip-on sensor that the worker affixed to their hi-vis vest. These devices provided feedback and hazardous movement data to the workers.

Delivered through the W2 Labs Innovation Programme, Wincanton deployed the SoterCoach wearable technology solution and passed **250 days without a lost time injury.**

The SoterCoach soluiton provided formalised monitoring, coaching, and support to assess compliance with manual handling training.

Wincanton worked with Soter during the 2019 W2 Labs programme. Today the Soter devices are used across **eight operations at Wincanton** and have delivered a **30% reduction in Spine Hazards per hour**, reducing incidences of poor bending, back twisting, and repetitive movements for colleagues in the warehouse.

Wincanton will continue to use the devices, implementing the program into safety processes and have colleagues **participate every six months to sustain their improved manual handling postures and stay injury-free.**

250 Days No Lost Time Injury

Case Study - 86% Reduction In Injuries & 67% Reduction In Recordable Claims

United Farmers of Alberta

UFA has consistently developed programs, looked at online/face-to-face training, strategized new safer practices; they've done it all. And although all these solutions have been beneficial, they **found them to be short-term and unsustainable for tenured or new workers.**

In November 2021 UFA rolled out the program on their pickers, sorters, and receivers at their DC and then due to the resounding success, continued in their retail stores, yard areas, bulk petroleum and cardlock facilities.

The results have easily justified the program with the longitudinal data showing that in 2021, before introducing Soter, the number of injuries and claims was consistently increasing. In Dec 2021 after Soter was implemented, there is a plateau in both claims and injuries **resulting in: 86% reduction in Ergonomic injuries 67% reduction in recordable workers' compensation claims (WCB) and 43% overall improvement in the number of spine hazards per hour.**

This equates to a **86% reduction in total ergonomic injury costs*** with an 11 x Return on Investment. In addition to the direct cost savings for reduced WCB claims, UFA is also trending towards a reduction in their WCB premium, which is based on the last 3 years of claims.

They have implemented the SoterCoach training into their new employee onboarding program at their distribution center. It gets their workers initiating the correct lifting and carrying technique from the start, before an injury or life-changing event occurs.

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REDUCE INJURIES

Get up to 86% of reduction in back & shoulder injuries

REDUCE LOST WORKDAYS

Achieve up to 30% of reduction in lost workdays

IMPROVE PRODUCTIVITY

Ensure smooth operations and reduce employee turnover

BOOST ROI

Minimize cost exposure while the benefits are demonstrated