



Soter Analytics Case Study

Soter Analytics is a Perth-based start-up that received a NERA Innovation Voucher for their SoterSpine solution – a low-cost, wearable product that monitors and records at-risk body posture movements to prevent musculoskeletal injuries in the workplace. NERA spoke to Soter Analytics co-founder, Matthew Hart, about working with potential clients, and the benefits that can flow when just one of them shares their innovation roadmap.

What is the SoterSpine and its potential impact on individuals and industry?

All companies with a large industrial workforce face challenges around workplace safety. Musculoskeletal injuries account for more than 50% of all workplace injury costs because they occur frequently and recovery time is usually lengthy. The high cost of these injuries is borne by both the company and the injured worker, with rehabilitation, lost productivity and potential long term impact.

The SoterSpine is a solution that helps to predict musculoskeletal injuries before they happen by identifying hazardous body posture movements. It is a wearable sensor that clips onto an employee's clothing to monitor what's happening to their musculoskeletal system throughout the work day. It's low cost, water and heat proof, rugged, and has a minimum battery life of six months.

The SoterSpine continuously captures human movement data. The back-end analytics then search for 'events', such as an employee picking up an object from the floor, twisting, bending, or spending extended periods in a static work posture. The algorithm captures and analyses events and allocates a risk score, which is then transmitted to the employee's smart device so they can see their own risk levels, as well as suggestions on how to reduce their risk of injury. Aggregated data from all employees is supplied to the employer so trends or high risk areas can be identified, and training efforts or improvements targeted.

How did you come up with the idea?

Soter's co-founder, Alexey Pavlenko, and I developed the SoterSpine in six months, tapping into my background as a reliability engineer in the mining sector. In this context, we take data from sensors on machines, analyse it, and reduce machine breakdowns. I believe people are just more complex machines. If we put a sensor on a person and start analysing the data, we will see if they are at higher or lower risk of injury – just like a breakdown on a machine – and if we know the risk, we can implement controls to prevent the event from happening.

Once we had the idea of putting a sensor on a person, we researched historical data about injuries we might be able to predict and prevent and found that musculoskeletal injuries are both a huge problem and possible to trend over time. A person very rarely gets a back injury suddenly – it's usually the result of a period of abuse. We could detect this period of abuse and make the change in time to stop the injury, and help companies move from a reactive to a proactive approach to injury management.

Are you working with an end user for developing or trialling the SoterSpine?

We took our ideas about wearable technology to potential customers to see if it was something they wanted because we didn't want to spend any money until we were confident about this. One of them shared their technology roadmap with us and this demonstrated that they wanted to explore ways to prevent workforce injuries. They also identified wearable technologies as a potential solution to this problem, so we had a company with a problem they wanted to solve using the type of technology we wanted to make.

That company had been unable to find a suitable wearable solution on the market so they provided us with funds to start our research and development, and also gave us access to their workforce to test as we developed. This was ideal, because we developed the SoterSpine with the customer, making sure it helped their employees while giving them the value they sought.

We trialled our system with over 100 workers from that company, collecting and analysing data from devices they wore. This demonstrated the SoterSpine's effectiveness in reducing the risk of back injuries in a range of roles and environmental conditions. Working with the end user was a huge benefit for us, for the customer and their workforce.

How do you see the SoterSpine entering the supply chain?

Does it have an application beyond the energy resources sector?

The SoterSpine will be available as a solution ready for easy implementation. We have three enablers for this. The first is that our solution works. On-site testing has delivered a reduction in the risk of musculoskeletal injury of up to 70%, so we can make a big impact on the workplace. The second enabler is the low cost of the product, and the third is its easy implementation. It's effectively plug-and-play, so employees can set it up themselves in under a minute, clip it on and go.

The SoterSpine can be used in any industry where people undertake manual tasks. We have existing and potential customers from the mining industry, and trials scheduled in the energy industry in Queensland, and in the construction sector in Belgium and the United Kingdom.

How has receiving a NERA Innovation Voucher helped with the SoterSpine?

The NERA Innovation Voucher has allowed us to improve the design of the SoterSpine device hardware and get it ready for manufacture. The grant will go towards preparation for manufacture at the factory and a production run of 5,000 units for the energy resources sector. It has been a big support at the right time for us.