

# Medical wearables put spotlight on unseen risks

Zoe Whyatt discusses how medical wearables have been shining a light on the unseen risks of workplace injury

**“AT 7.23am on Wednesday morning, 53-year-old bottling plant worker John Erstone had just checked a CO2 saturation unit when the feed to a capping machine malfunctioned due to an apparent mechanical jam. Mr Erstone reached in to investigate the matter when a colleague accidentally restarted the machine, which ripped the skin clean off of Mr Erstone’s arm from the elbow right down to the hand. With substantial blood loss resulting, emergency services were quick to attend, and hospital sources have confirmed that Mr Erstone remains in a stable condition.”**

You probably had no troubles visualising that, and you’re forgiven for any potential cringing. Now read another incident report:

“SLINGTON, London  
-- On Monday 2 March, 24-year-old bricklayer Sam Barker was erecting a wall at the Johnstone Hospital redevelopment. A heavy industrial cement mixer was placed in close proximity. Work colleagues witnessing the event report that Mr Barker bent down to pick up a brick

at 1.21pm. The brick was placed on top of the wall and fixed in place, but only a few seconds later, Mr Barker again bent down to pick up a brick. He applied mortar and fixed it in place on top of the wall. This procedure was then repeated throughout 1.22pm, 1.23pm and 1.24pm. Worksite sources estimate that, by 3.45pm, Mr Barker had in fact laid some 2,300 bricks. At that point, he knocked off and had his third coffee for the day.”

The point of contrasting these two (fictitious) reports is that, while they both describe the causes of debilitating injury, the latter would never make headlines. Yet, traumatic workplace accidents (arms in capping machines, etc.) account only for a very small

proportion of the total number of workplace injuries. Degenerative disorders (repetitive strain injury, etc.) are 700% more prevalent.

Developed over extended periods of time, such injuries are often due to movements, loads and angles that can be hard to spot even for the trained eye.

**“Manual handling injuries remain the leading cause of lost time among workers in the developed world”**

Implementing efficient preventative measures therefore becomes a double challenge: you first have to identify the risks and then convince staff to change work processes although they might not see any issues with “the way things always have been done around here.” The value of safe practices around heavy machinery and vehicles is a lot easier to appreciate than the finer points of ergonomics – in spite of the latter actually causing the vast majority of debilitating injuries.

Manual handling injuries remain the leading cause of lost time among workers in the developed world, and the amounts paid for chronic work-related musculoskeletal disorders (WRMSDs) are the most expensive of all workers’ compensations. In the UK 8.8 million working days are lost due to WRMSDs, accounting for 34% of all days lost to work-related ill health. Perhaps most alarming is that despite best efforts by health and safety professionals, these rates have remained unchanged for the last 5 years, costing the UK economy an estimated £5 billion a year.

The true cost is undoubtedly even greater, however. MSDs are linked to a wide range of direct and indirect consequences, from chronic pain and pressure on the health system, to increased pressure on remaining team members and loss of work morale and productivity. Affected employees returning to work are also five times more likely than others to injure themselves again. Once the damage has been done, a negative spiral often ensues.

## Prevention is key

Fortunately, thanks to recent technological advances, there are now tools available that provide objective data from the actual workplace, clearly indicating where the everyday reality of the individual employee will eventually take them. The future of wearable medical devices has arrived.

For consumers, there’s already a wide range of equipment. Heart rate monitors and GPS

watches have been around for decades; now they've been joined by equipment such as FitBit and Apple Watch that give you access to a wide range of data for personal use. However, while an error margin of a few degrees or a pretty good muscle activity sensor probably is acceptable for amateurs working to improve their bicep curl or golf swing, the situation is quite different when you're employing the technology in a professional capacity.

Elite athletes know that it often is very small details that make the difference between a place on the podium and a season spent at the sidelines. For workers, the stakes can be a lot higher. Even in a relatively low-impact area such as office work, a few degrees difference in body angles can over time spell either a productive career or a repeat pattern of long-term sick leave. More physical jobs, like production line or construction work, subject employees to impacts that are more or less guaranteed to result in injury – unless you know how to mitigate the risks.

Manual handling aids, more ergonomic workstations, improved policies and similar measures all hinge on how accurately you can assess different risk profiles and identify best practices. That's why only medical-grade wearables are of any use in workplace health and safety. Preferably, they should have been officially cleared for professional applications by a government body, such as FDA.

Apart from providing workplace health and safety experts with invaluable data for decisions on major investments and policy changes, these wearable medical devices leverage the same appeal that has seen FitBit rise from nothingness to a company valued at \$4.1 billion. People are fascinated with their own health and fitness, so these devices are incredibly powerful tools for engaging staff. Workplace health and safety training now have the irrefutable rationale to change “the way things always have been done around here”.





Just what difference objective field data can make was shown in a project at Heathrow Airport, which won the 2016 BSIF Safety Excellence Award. Heathrow used ViSafe wearable sensor technology to assess the movement and muscle activity in real time, in the baggage hall.

Airport baggage handlers face a relatively high risk of injury. Their work involves a considerable amount of bending, twisting and lifting, the cumulative effect of which can be hard to assess without objective data. Furthermore, occasional unlabelled overweight bags increase the risk of traumatic injury. It's an environment where manual handling aids (MHAs) can mean everything.

Having invested in advanced MHAs, Heathrow wanted answers to two key questions: did the equipment actually provide significant relief, lowering the risk of musculoskeletal injuries;

and could objective data help engage the workforce in correct use of the equipment?

Providing detailed objective data, the ViSafe study returned unequivocal results. The answer to both key questions posed by Heathrow was a resounding yes! With the MHAs proven to decrease strain on shoulder and back muscles by 67% and 88% respectively, expert trainers were much better placed to educate and convince the workforce. As a result, correct staff use of MHAs went from 20% to 80% within three months of the study.

These are certainly exciting times in professional health and safety as well as elite sports. Coaches, ergonomics experts and physiotherapists now have access to a veritable crystal ball. Never before have we been able to make choices that are this well informed.



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