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## Sleep is a weapon: Sports, and society, discover Jason Bourne's secret

By David Ebner

*Culture has long made a hero out of the person who plows through life on little sleep, but times are changing and sports teams are starting to agree: Rest is a weapon, David Ebner writes*

There is a hidden advantage in the arsenal of the assassin Jason Bourne.

It is underlined by author Robert Ludlum in his 1990 thriller, *The Bourne Ultimatum*, the third in a trilogy of books that eventually became hit movies starring Matt Damon. Ludlum wrote: "'Rest is a weapon,' said Jason, repeating a phrase he had come to believe was a vital truth, vital for survival."

The words rang in the mind of Sam Ramsden, the director of player health and performance for the Seattle Seahawks. The football team employs an array of off-field tools, to complement its smash-mouth brand of old-school football. So, before the 2013 season, Ramsden connected with Fatigue Science, a small Vancouver company that works with companies in mining and transportation, and had first made its mark when it showed the Vancouver Canucks how to better navigate the hockey team's difficult travel schedule.

Fatigue Science helped the Seahawks tinker with their planning, especially for East Coast games, which included the Super Bowl in February in New York, where the Seahawks pilloried the Denver Broncos 43-8 for the team's first championship.

"As an assassin, Bourne's goal was to get more sleep than his enemies," Ramsden said in an interview. "That really resonated with me. Society is learning this, too, how important sleep is and how dangerous sleep deprivation is. We're teaching our players: Sleep is a weapon."

North American culture has long made a hero out of the surgeon, the investment banker, the politician who plows through life on far less sleep than the prescribed eight hours dictated by human bodies. Science – spanning studies from Harvard University to the work of Fatigue Science – clearly shows this is foolish, and that significant fatigue is the equivalent of being drunk on alcohol.

Athletes, whose performance is underpinned by bodies alert and at their prime, have among the most challenging

work schedules of anyone. Games occur often at night, and in general happen at different times of day, in different cities, across far-flung time zones.

There's a lot of time spent in unfamiliar hotel beds and generally requiring sleep when you can get it, such as afternoon naps before a game in the evening, standard in sports such as hockey and basketball.

The Canucks, in 2009 under then-general manager Mike Gillis, were the first sports team to sign on with Fatigue Science, and in fact were the company's first significant customer. Business, five years later, is taking off for Fatigue Science, and the Canucks remain a key client.

The hockey team will travel about 70,000 kilometres this season, similar to teams such as the Los Angeles Kings and, in basketball, the Lakers. In 2010-11, when the Canucks lost the Stanley Cup in Game 7, the team's travel, including the long playoffs, reached 125,000 kilometres – which is one-third of the distance to the moon. The Canucks spend about two months in hotels, 59 nights this regular season and 62 last season. Legends such as Wayne Gretzky and Kareem Abdul-Jabbar are estimated to have travelled 1.8 million kilometres through their careers, which, roughly speaking, is the same as going to the moon and back – twice.

"Sleep is huge," said Brad Richardson, who played for the Kings five years before joining the Canucks last season. "Even coming from L.A. to here, the travel's a lot harder – clearing customs every time, it adds on. We have meetings and you see the graphs and charts: You can't be at your top performance if you haven't slept. Your reaction time's down, your thinking process is slowed."

The emerging science around sleep and fatigue is striking. A 2012 Harvard study, research published in the journal *Surgery* from the American Medical Association, investigated orthopedic surgical residents, and used Fatigue Science's Readibands. These are watch-like devices worn on the wrist that employ a motion sensor to assess the quality and quantity of a person's sleep, and provide an "effectiveness score."

The typical amount of sleep the residents had was 5.3 hours. At work, the study found residents were "fatigued" half of the time, and "impaired" one-quarter of the time. Because of this, the "risk of medical error" jumped 22 per cent.

A major cultural shift in thinking is under way, one that began in the arena of sports and has begun to percolate more widely.

When the Canucks first hired Fatigue Science, there were some snickers, but when the team's record on the road improved, people paid attention.

This year, Arianna Huffington, publisher of the Huffington Post, highlighted the value and importance of rest in her No. 1 bestseller, *Thrive*, which noted Fatigue Science's work with the Dallas Mavericks. Kobe Bryant, five-time NBA champion with the Los Angeles Lakers, once eschewed sleep and today is a convert. "I have a hard time shutting off my brain," Bryant in September told *The New York Times*. "But I've evolved. I'm up to six or eight hours now."

Asked what had changed, Bryant said: "Growing up, and understanding the importance of shutting down and unwinding." Bryant recommended taking a hot shower before bed.

At Fatigue Science, which has a small office above the popular retail stretch of Robson Street in Vancouver, business had ticked along for several years until it began to take off in June and July, and the company has signed on about 100 new customers in 2014. Revenue this year could crack \$2-million, which would be more than double that of 2013.

"What we've done is taken a subjective art around fatigue management and human performance, and turned it into an objective science," company founder Pat Byrne said in an interview.

Byrne's journey in the science of sleep is something of an odyssey. The 61-year-old's previous career was as a commissioner in the appeals division of WorkSafeBC, British Columbia's workers' compensation board.

In 1996, Byrne drew inspiration from family tragedy, when his nephew, Jay McBride, died. McBride drove his car off a highway in remote northeastern B.C. after a long day of work in the forestry industry. McBride, heading to see his fiancée to talk about wedding planning, fell asleep at the wheel. He was 22.

Byrne set off on a mission to scour all corners, from academia to the U.S. military, to figure out a way to better address fatigue. In 2005, he started a consulting company, and in late 2007, founded Fatigue Science.

It was a gamble. Byrne quit a secure career to pursue a passion – and did it in his early 50s, not the age when a person usually becomes an entrepreneur. He piled in a lot of his own money, and was buoyed by \$2.5-million in funding from 37 angel investors in 2008.

"It was a lot harder than I had ever imagined," said Byrne, who speaks swiftly and with the staccato flow of an evangelistic/scientist – a bit nerdy, a true believer in the mission. The Canucks deal was the key early boost, as was work with Rio Tinto Group, the anglo-Australian mining giant. "I was on the right path," Byrne said.

The basis of the Fatigue Science is algorithms and software from the U.S. Army and Air Force, controlled by the company through several commercial deals. The second pillar is the Readiband.

The new challenge at Fatigue Science is to kick-start growth. Sports teams are believers, an industry where rest is an essential alongside conditioning, nutrition and the like.

Fatigue Science works with about 25 teams, which accounts for one-third of the company's revenue. Sales to transportation and mining companies, as well as the U.S. military, account for most of the rest. A gain in hockey next year is expected. The Canucks currently have the exclusive NHL rights to Fatigue Science's technology, a three-year deal in its final season.

In other industries, chief financial officers remain skeptics. Fatigue Science likes to note an example of an oil sands shift worker, who has to get up at 3 a.m. for an 11-hour shift, 6 a.m. to 5 p.m. This sort of scheduling leaves the worker impaired – basically drunk – for two-thirds of the shift, in terms of reaction time. Waking up in the middle of the night is an attack on the body's circadian rhythms.

If the person instead sleeps one hour later, to 4 a.m., and works the same 11 hours from 7 a.m. to 6 p.m., the amount of time during the shift spent impaired falls to one-quarter, according to Fatigue Science.

"The challenge is making CFOs aware that this tool can help improve the bottom line," company chief executive officer Sean Kerklaan says.

At Arrow Transportation Systems Inc., headquartered in Kamloops, B.C., with 600 drivers across Western Canada and Ontario, the company uses Readibands to show drivers what their sleep looks like. "Helping people understand how their bodies work," Arrow director of safety Rick Viventi said.

"Some people think as they age, they need less sleep," Viventi said. "The data shows you need more sleep than you think you do. People are grasping it a little better. They do see there is concrete proof."

In Seattle last year, about 20 Seahawks, for stretches during the season, wore Readibands. Quarterback Russell Wilson wore his all year, up to the Super Bowl. Cornerback Richard Sherman, halfway through the season, stopped, because the data showed he was an ace sleeper.

This year, about 30 Seahawks use the bands. The team doesn't want to push the technology on players, which, because of the monitoring element, can be considered unduly invasive. Players that embrace it get competitive – because the band displays a score.

A figure of 70 out of 100 is the equivalent of the reaction time of a well-rested person who has a blood alcohol level of 0.08 – drunk. A number above 90 is clean and sober – normal reaction time.

The Seattle Mariners got on the program this past season and relief pitcher Joe Beimel posted a picture on Instagram

in May of his tattooed wrist/arm, and the band. "Hopefully it will be as good of a tool for the Mariners," Beimel wrote, as it was for Wilson and the Seahawks.

Sleep is only one factor of many, but the Mariners nearly made the playoffs for the first time in 13 seasons, missing by one game. They had a better record on the road than at home, and were tied for the third-best road record in baseball, 46-35, which was an 11-win improvement on 2013's 35-46 performance on the road.

The Brooklyn Nets – with a roster of older players – signed on with Fatigue Science last year. The team defeated the Toronto Raptors by one point in Game 7 of the first round of the NBA playoffs last spring. Again, sleep is only one factor of many, but the Nets' win and work with Fatigue Science, known in hockey because of the Canucks, was enough for CBC's Ron MacLean to talk about the advantage on Hockey Night in Canada, where he cited improved shooting by Brooklyn.

The Raptors are new customers this season, though the team doesn't correlate the loss to the Nets with signing on with Fatigue Science. The Raptors, while mum on details, have made adjustments to different parts of their schedules. A big factor is when to leave a city on the road. The Canucks learned it can be smarter to stay in a city after a road game, sleep well and then fly the next day, rather than the long-held standard of getting straight on a plane and flying during the middle of the night.

"We're just looking for better ways to put our players in a position to succeed," Alex McKechnie, the Raptors' director of sports science, said.

What the Seahawks learned was the primacy of staying on Pacific Time, instead of trying to adapt to Eastern Time, a gaping difference of three time zones. The body cannot adapt fast enough during a short road trip for one football game. Another lesson is to "bank sleep" – get as much as possible, when you can. It will help offset jetlag. Rest is not about one night, it's the span of a week that really counts.

The Seahawks – with a 4-3 record, not off to the dominant start many had predicted – are an unusual football team. The coach, Pete Carroll, runs the squad with a positive attitude, rather than the stereotypical screaming of an angry football coach. Some of the players meditate. There's organic chicken and eggs served at the practice facility, acquired from a small farm in nearby Olympia. Ramsden will even look at things such as amino acid deficiencies in players' blood tests as an indicator of inadequate levels of serotonin and dopamine.

To Ramsden, sleep is a "key pillar" in improving health and performance.

At the end, however, for all the seeming non-football-related strategies, the Seahawks are a classic gridiron team, deploying a run-focused offence in the pass-happy NFL, and dependent on a ferocious defence.

"It's all to ready athletes," Ramsden said. "It's still getting ready to play a certain style. To be ready on Sunday."

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