



SPECIAL FEATURE

Science Of HIGH PERFORMANCE

Scientific training played a major role in **Abhinav Bindra's** quest for perfection. Now that he has put down his rifle for the last time, he wants to ensure technology is easily accessible for everyone

By Priyanka Sharma

Photographs by Vinay Dahiya for SI India



These words hold a special place in Abhinav Bindra's life, especially in his career. Thus, it's no surprise to see these words and the five interlocking Olympic rings boldly emblazoned on the walls of his revolutionary Targeting Performance Centre in Sector 82 in Mohali. They pithily sum up Bindra's single-minded pursuit to achieve perfection for 22 years at the shooting range. They are imprinted so strongly on his psyche that he will probably live by this motto for the rest of his life. Because, for Bindra the process is more important than the result.

It's equally remarkable that since the last time he picked up his Walther rifle on Aug. 8, 2016, at the Olympic Shooting Centre in Rio, the man who would eat, breathe and sleep shooting for the better part of his adult life, has not touched the gun. Despite

missing out on his second Olympic medal by a mere 0.1 point in the final shootout for third place, Bindra harbours no rancour or regret. The Beijing gold medallist is at peace with himself. "The last time I picked up the rifle was a year ago. I have never been back and I have no intention either," says Bindra.

The shooting ace has already set up two centres in Mohali and Delhi, with the third one coming up in Bengaluru. Bindra might have retired from the sport, but he isn't cooling his heels, not yet. In fact, he says, he is as busy as before, if not more. His latest obsession is to set up a chain of state-of-the-art sports injury rehabilitation centres across the country. He is also the chairman of the Target Olympic Podium Scheme (TOPS) of the Ministry of Sports and Youth Affairs and heading the Olympic Task Force that was set up under the direction of Prime Minister Narendra Modi after India's dismal performance at the Rio Games to chart a clear roadmap to improve performance in the next three Olympics. He is also a member of the Sports Code Committee and the government designated observer for shooting. Given the way he has performed in his multiple roles until now, it seems he has made a seamless transition from being an athlete to a sports administrator in the making.

DRIVEN BY PERSONAL EXPERIENCE

As we wait in the conference room of the Abhinav Bindra Foundation, Digpal Ranawat, high performance director at the centre,



gives the lowdown on the array of equipment that is used for analysis at the Targeting Performance Centre. According to Ranawat, who has been Bindra's long-time physio, these cutting-edge analysis machines that cost around ₹3 crore total can be used by anyone from elite athletes to layman for rehabilitation.

Exactly at 2.15 pm, Bindra walks in. His clumsy and stiff shooting jackets and pants have given way to elegantly cut suits and crisp shirts. The intense practice sessions have given way to business meetings. But his obsession with "process" and "pattern" remains unchanged. For someone who valued the journey more than the end destination, Bindra is applying the same philosophy to develop a sports science ecosystem in the country—an area in which India lags far behind the traditional medal powerhouses at the Olympics.

The Beijing Games gold medallist is drawing on his rich experience gleaned from his long foreign exposure when he trained under the best coaches, consulted the best sports medicine experts and visited the best sports science centres around the world to build a legacy that will benefit the next generation of athletes. His trust in quality over quantity was the secret of his success in the Olympics, the World Championships, the Asian Games and the Commonwealth Games. His discipline—the 10m Air Rifle—defined by a constant pursuit of perfection and precision measured in microns, often pushed him to explore both the conventional and



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unconventional methods of training—like commando training and climbing a 40-foot pizza pole in the quest for excellence. It's this ethos that's driving Bindra in his latest venture.

"Medical fitness and high performance in sports are very closely linked. In my career of 20 years, I visited the best high-performance centres across the world," Bindra tells *SPORTS ILLUSTRATED INDIA* about his latest venture. "There were always limitations to it, primarily because everything is assessment-based. Every time you get yourself assessed, you get a 40-page report to take home. I was introduced to this technology last year when I visited the famous sports medicine expert, Dr. Hans-Wilhelm Müller-Wohlfahrt, the long-time doctor of the German national football team, Bayern Munich and Usain Bolt. This technology has been a revolution across the world, it's pretty new and after using it I realised its power. That's when I thought I should bring this technology to India."

Typically, each centre is equipped with the latest generation of five machines—Isolift, Stabilometry Platform, Walker View, Postural Bench and Balance Trunk—that have been set up in collaboration with Italian fitness company TechnoBody. In fact, Bindra was so convinced by the result of the Stabilometry Platform that he customised it to make it portable and lugged it around

the world as he prepared for the Rio Games in 2016. "I carried it to work on a daily basis, to train for my balance in a very precise manner, which I wouldn't have achieved otherwise. It helped me get better as I made a lot of gains," says Bindra. The champion shooter revealed that earlier his balance training used to be more intuitive which obviously lacked the precision he desired. "For example, when I did cardio on this machine, it forced me to do things with a lot more control, which is so important in my sport," explains Bindra. "Earlier when I did cardio without control, I might have been working better in cardio, but I was spoiling other aspects of bio-mechanics. In the long run, instead of improving my performance, it was actually hurting it. After combining with technology, I was able to improve my cardio, yet work on my control and do everything with a lot more balance. It had a multiplier effect that helped me to make much larger gains in my overall training."

SPORTS SCIENCE AND INDIA

The science that drives the performance of elite athletes always intrigued Bindra. He was always fascinated by the scientific methods of training and recovery. It put him on a path of discovery and experimentation that helped him in various

phases of his career to improve performance or recover from injury. He admits that "rehabilitation and medical fitness have a long way to go in the country." With the rapid evolution in technology that drives the science of sports, India has some serious catching up to do. He stresses that sports science must be integrated into India's sporting environment at the grassroots level.

"The entire ecosystem needs to be developed around sports science, because it has become such an integral part of high performance," says Bindra. "The world has made tremendous advances in the way athletes train. Until we don't embrace science and technology by not only getting access to them but also by acquiring the requisite knowhow to implement them and make the best use of them, we won't make the gains that we aspire for."

In India, basic medical support is often confused with sports science. The lack of understanding about the specifics of both sports medicine and sports science, barring a few exceptions, underscores the acute knowledge gap. This is the gap that Bindra intends to plug with the Targeting Performance Centres. "India lacks specific medical support. So, we need to get the expertise from outside, yet we need to empower our own people with the requisite information so that they can implement things on a day-to-day basis on the ground," says Bindra. With these centres, the shooter-turned-entrepreneur hopes to usher in a new mindset about injury management and rehabilitation, which in turn will improve the performance of athletes. "It's the need of the hour to have centres like this all over the country. A sports body like the BCCI is in a fortunate position because they have

21ST CENTURY

Technology helped Bindra understand his body better and improve his performance. He now wants to make it accessible to all.

a lot of resources. So, there's no reason why they shouldn't have such centres, or even bigger ones, to serve the requirements of all cricketers. It's the need of the hour because every day matters, every training session matters," says Bindra. "To deliver high performance, it requires a big support system,

every little thing matters, attention to detail is required and that makes the difference in winning a gold at the Olympics and finishing 10th. In the U.K., they only work on the last one percent because their structures are strong and a majority of their investment in sport is only towards the one percent gain of the athletes. At the highest level, it's all about that one percent."

A couple of months back, the Abhinav Bindra Foundation received a grant of ₹5 crore from the Ministry of Sports and Youth Affairs to set up a Targeting Performance centre in Bengaluru. Once the centre becomes functional, it will work closely with the Sports Authority of India's south centre—the venue for many national preparatory camps before major championships. It will work with some of India's top athletes in areas of rehabilitation, fitness training and performance enhancement. Already, some of the top sportspersons in the country such as hockey goalkeeper P.R. Sreejesh, drag-flicker Rupinder Pal Singh and the country's best male squash player, Saurav Ghoshal, have benefited from the technology during their rehabilitation. Its business aspect apart, there is a philanthropic angle too. Youngsters enrolled with the foundation can use the facility free of cost.

PAST AND FUTURE

In terms of sporting glory, his Beijing Olympics gold medal is perhaps the most defining moment in a career that spanned five Olympics. But it's worth recalling that he came agonisingly close to winning a medal on two occasions—Athens (2004) and Rio (2016). Many would have carried that burden of regret in seeing medals slip through their fingers. But in Bindra's world, regret doesn't matter much. "I have talked about this on numerous occasions, that I had a great closure to my career. I had a lot of satisfaction as I did the best that I could. And I am very pleased, I don't have any regrets," says Bindra in a calm voice. "I don't miss being an athlete. I have moved on from that phase."

It also doesn't come as a surprise when he says: "I don't have too many memories of winning a gold medal." But he remembers very well his daily pursuit to reach the gold that lay at the end of the rainbow of perfection. "What memory I do have is pushing myself on a day-to-day basis, trying to improve. For me the journey is more important than the destination. That is something which I live with. A gold medal is an outcome, it's something on my wall and it doesn't have much value to me anymore."

In a little over a year since he last picked up his gun, Bindra has moved on to other things. Post the Rio Games, he was



EYE ON YOUTH

Bindra is eager for sports science to be available to young sportspersons at the grassroots level, when getting the basics right is crucial.

tasked by the National Rifle Association of India to come up with a review of India's performance in shooting. His blunt assessment didn't go down too well with some in the shooting fraternity, who are still actively competing. But Bindra is nothing if not brutally honest. It's always

tempting to ask the lone Olympic gold medallist when India will produce another shooter like him. "It's an easy question to ask but very complicated to answer," he says. "I will not get into it, but I would insist on having a grassroots programme that is absolutely necessary and a missing link in our country. There's a lack of facilities, lack of requisite knowhow at the grassroots level. When kids start playing a sport here they must have a strong foundation and that can only happen when you provide them with the right input from the beginning or else they will develop the wrong habits, wrong techniques, which will be difficult to break."

In his own way, Bindra is trying to address the issue through his foundation. In this context, the chain of Targeting Performance Centres that are being set up is an extension of making cutting-edge knowledge and sports science accessible for all. The foundation is also working closely with schools to make shooting accessible for youngsters. For him it's all a part of the process, because if the process is right, the results are a mere byproduct. □

ASSESSMENT PROCESS

It takes just 90 minutes for an athlete to get their bio-mechanical assessment report. In fact, Ranawat informs us that top European football clubs such as AC Milan, Roma and Real Madrid among others use the same equipment that has been installed at the Targeting Performance Centres. "When we talk about high performance and sports rehabilitation in India, we are still in the ancient ages. This centre is one-of-its-kind in the country and the uniqueness of the technology we use here is that we can do assessment, training and rehab with the same set of equipment. We can precisely know the problem and carry out corrective measures," explains Ranawat (pictured right).

Elaborating further, the high-performance director says: "To carry out a bio-mechanical assessment of an athlete for a specific sport, we need to understand the static control, dynamic control, pelvic control and how lack of control in one of these variables can affect their range of motion or can form dysfunction when they walk or run.

"Till date we didn't have a device for pelvic stability test and most compensation happens from the pelvis, but now we can precisely pinpoint the compensation. We combine all the results into the run analysis tool to prepare a blueprint. After that we chart out a suitable programme."

To understand better how this technology works on an athlete's body, Ranawat asked me to get on the treadmill. It's not a usual one, though. It's called Walker View, which is equipped with a 3D camera, sensors and a TV screen that provides real-time readouts of the human body in motion. "The four load cells give precise information about weight bearing on either side. They provide real-time information about the body's centre of gravity in motion, which in turn helps us to correct the trunk and pelvic positions," explains Ranawat.

My result provided a very accurate assessment. Due to a lower back problem, I was putting too much pressure on the left of my body. The Walker View pinpointed the problem with my movement. Ranawat warned me that in the long run I would be in trouble if it wasn't treated properly.

I was then put on the Stabilometry Platform for a dynamic stability test. It's a bio-feedback system that measures balance and assesses posture control. My movements were indicated by a blue dot, much like the cursor on a computer screen. He instructed me to keep the blue dot as close as possible to the innermost ring of a series of concentric circles. I tried my best, but gave up because the sensors could detect even the slightest of move-



ments. It was then I realised how difficult it is to stand absolutely still. Everybody wobbles that tiny bit even when standing still which the human eye can't detect, unless one is Bindra.

A 30-second test is all that is required to point out the problem. Needless to say, my results were embarrassing, but Ranawat, out of sheer generosity, said, "There's scope for big improvement. We have training programmes that will help you improve your stability."

At this point our photographer asked Bindra about his score. He had sported a faint smile while I was undergoing the test. Though he preferred to remain silent, the look on his face suggested that he didn't want me to be embarrassed any further. But Ranawat's answer provided a clue. "He is very still. The next best to him can be a rock. He can still think of competing in the 2020 Tokyo Olympics."

Injury rehabilitation is the other area of expertise of Targeting Performance. Careers of many promising athletes have hit a dead end prematurely because of lack of understanding about the importance of rehabilitation. Thankfully, some of the sports federations in the country are realising the importance of this critical aspect in modern sports. "There is a fine line when we talk about high performance and injury. That fine line is increasingly getting determined by high-tech monitoring systems. Until recently, it was not possible to monitor those parameters, but now these devices help us to understand the human body better. We can now monitor various parameters which helps us in injury prevention and management," says Ranawat.

Elaborating further, the high-performance director explains that there is no specific device for rehabilitation. But, by analysing data from the three different devices, it's now possible to get a pretty accurate idea of the extent of injury and what needs to be done to chart out a good rehabilitation programme. "If an individual picks up an injury or feels pain in some part of the body, there will be a lot of compensation. He will put pressure on the other side of the body, which will affect his hip or spine. However, with this range of equipment we can find out by how many degrees his range of motion has been restricted. That in turn gives us a better understanding of the type and quality of rehabilitation needed," says Ranawat.

ISOLIFT

Meant for functional training which analyses activities like squats, running and lifting. The sensors embedded in the platform and the three-dimensional camera generates various markers on the screen for a particular activity. Any deviation from the optimum will create a pattern after a number of repetitions. This information is critical for developing accurate training methods and to reduce chances of injury.

STABILOMETRY PLATFORM

It is used to analyse dynamic and static stability. It generates data about trunk and pelvic stability, which is crucial for both dynamic sports like football or hockey and static sports such as shooting or archery. It helps to devise specific training methods, which in turn acts as a force multiplier for performance.



WALKER VIEW

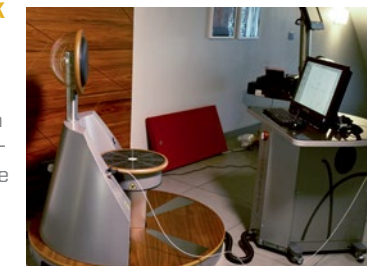
Looks like a treadmill but it's more than that. It's a lab that has three load-measuring sensors on each side and a 3D camera. Its embedded computer monitors and records step length, step speed, step symmetry, range of motion of the hips, knees and ankles. All these functions create a unique system for a complete and usable Gait Analysis without any wearable device. It can also measure the amount of weight applied on each side of the body during a dynamic activity.

POSTURAL BENCH

This allows one to accurately and objectively quantify the level of tension and symmetry of one's "posterior chain" and, if necessary, with the support of your trusted professional, start a postural reconditioning path.

BALANCE TRUNK

This device helps segregate trunk stability from pelvic stability. An unstable pelvis influences the spine posture, which in turn affects the overall posture of an athlete.



Inaccurate posture leads to compensation, which can result in injuries and sub-optimal training.

—Priyanka Sharma

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