



### Pramod Karan Sethi

Co-inventor of the Jaipur foot.

Born on Nov 23, 1927, in Benares (now Varanasi), India, he died of cardiac arrest on Jan 5, 2008, in Jaipur, India, aged 80 years.

In the late 1960s, Pramod Karan Sethi was working as an orthopaedic surgeon—although, by his own admission, not a fully qualified one, as he had only trained as a general surgeon and was forced into service when his hospital needed an orthopaedics department—at Sawai Man Singh Hospital in Jaipur, India. Much of his practice was physiotherapy, and the hospital's rehabilitation centre provided treatment to amputees. Options were limited. "The rural population would discard the available prosthesis before they would get home", Neena Bhandari, who knew Sethi for 40 years, told *The Lancet*. The available western limbs were expensive, and were too rigid to allow people the mobility they wanted. "We sit, eat, sleep, and worship on the floor—all without shoes," Sethi told *Time* magazine in 1997.

Sethi and Ram Chandra, a craftsman who was working in the hospital teaching patients with leprosy to make handicrafts, decided they could make a better prosthesis. It was trial and error for the pair until they arrived at a hinged wooden ankle, surrounded by a vulcanised rubber foot. The resulting foot, now known worldwide as the Jaipur foot, can be cast in plaster of Paris and built for an individual in 45 min, and lasts 5 years. It consists of various types of rubber: a shell filled with sponge rubber, a stiff piece for the metatarsals, and microcellular rubber for the heel, cut in places to allow for joint-like movement. Bhandari noted that "the modified

design was more flexible, allowing the wearer to climb trees, pedal bicycles, and use Indian style toilets".

Sethi presented the Jaipur foot to orthopaedic surgeons from the UK's Oxford University, in 1971, and they were impressed, but by 1975 just 59 patients had received the prosthesis. It gained popularity during the Afghan war when Russian forces placed countless landmines. Since then, millions of amputees worldwide, many of them victims of landmines and other ordinances, have been fitted for it. Sethi sent colleagues from Jaipur to take the technology to Cambodia, Vietnam, and Bangladesh, and elsewhere. The beauty of the system, said J Steen Jensen, of the International Society for Prosthetics and Orthotics, Copenhagen, Denmark, is that it is inexpensive, costing about US\$30, and made of locally available materials. "It was a major breakthrough in technology for the developing world, and in its ability to reach the masses", Steen Jensen said. In recent years, work by Jensen and others has found that prosthetists in many places are not trained long enough to fit the Jaipur foot, which can lead to suboptimal results. The foot can also break down more quickly in countries with people of higher average body mass than that in India. But Steen Jensen still recommends it highly to students learning to fit prostheses, and notes that it remains the only realistic option in many countries.

Today, Chandra works with the Bhagwan Mahaveer Viklang Sahayata Samiti (BMVSS), a Jaipur charity that has fitted more than 300 000 amputees for the Jaipur foot for free. The relationship between Sethi and Chandra deteriorated after Sethi began being recognised for his work on the Jaipur foot, winning awards including the Ramon Magsaysay Award and a major award from Rotary International. They later reconciled to some degree. "Dr Sethi's role on the technical side was very significant", said D R Mehta, who founded BMVSS. "He helped Master Ram Chandra Sharma, a genius crafts person, who first conceived Jaipur Foot, as a guide. But for Dr Sethi's involvement the Jaipur Foot would not have been recognised by the medical world."

Bhandari became one of Sethi's patients in 1967 when she developed postpolio syndrome. "He was always dressed in blue denims and Kolhapuri slippers", Bhandari recalled. "He had lots of interns and doctors following him on rounds. He had this aura around him." Bhandari, now a correspondent for the Indo Asian News Service, remembers him as "a very gentle, calm kind of a person. There was a kind of a confidence that developed, that you were in good hands, and you were getting something that would fit your lifestyle."

Sethi, whom Bhandari recalled as "a voracious reader with an amazing memory and profound knowledge on a range of subjects", also had a knowledge of plants that "would put a botanist to shame". Sethi is survived by his wife, Sulochana, a son, and three daughters.

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