Denovo has been awarded Most Innovative Startup 2023 – 29 Dec 2023

With wound-closure device, Pune-based doctor aims to prevent needlestick injuries

Dr Nikhil Mamoria's patented, automated wound-closure device SutureSure is likely to empower doctors to do suturing effortlessly. It will be available in the market after it has been clinically validated.

As a medical officer at Pune's Sassoon General Hospital during the Covid pandemic, 28-year-old Dr Nikhil Mamoria often observed needlestick injuries (NSIs) among doctors and healthcare workers. This led him to develop a patented, advanced automated wound-closure device called SutureSure, and launch a startup, De Novo Bio Innovations.

"SutureSure will help doctors and surgeons by preventing needlestick injuries significantly with its innovative suture cartridges and needle-driving mechanism. It will also empower doctors to do suturing effortlessly with just two clicks. Suturing will be faster and more accurate during fast-paced, stressful, and potentially understaffed environments," Dr Mamoria, who developed the device while participating in a medical device hackathon (MEDHA) organised by IIT Bombay in 2020, said.

SutureSure plays a role in wound closures during all kinds of trauma surgeries, including minimally invasive surgeries. A prototype of the device is ready and the company is in the process of beginning clinical studies, after which pan-India trials will begin. It took three years to create the device and once it has been clinically validated, it will be available in the market, says Dr Mamoria, who studied at B J Government Medical College from 2014-19.

Healthcare workers are at increased risk of NSIs, which occur when the skin is accidentally punctured by a used needle. It has been estimated that over 20 bloodborne pathogens can be transmitted from contaminated needles including Hepatitis B (HBV), Hepatitis C (HCV), and human immunodeficiency virus (HIV). The World Health Organization estimates that around 66,000 Hepatitis B, 16,000 Hepatitis C, and 1,000 HIV infections among healthcare workers were caused by NSIs. According to the Centers for Disease Control and Prevention (CDC), around 6 million NSIs take place in the USA alone. Such injuries are considered to be much higher in developing countries and around 75 per cent of such cases are not even reported.

The most common cause of NSIs, as identified by the CDC, is suturing needles followed by syringe needles, says Dr Mamoria. Suturing, he points out, is the most ancient, most effective, and highly adaptable way of wound closure till now. However, it is also the most common cause of NSIs and also acts as a barrier to the adoption of minimally invasive surgeries like laparoscopy when performed using conventional instruments.

Currently, in India, around 85 per cent of laparoscopic instruments are imported from the USA and the UK at a cost that makes it highly unaffordable for middle-income countries, says Dr Mamoria.

"I left my clinical practice with a vision to empower surgeons with innovative medical devices to deliver exceptional care for patients. I always wanted to be a surgeon but I would have just catered to thousands of patients… I feel that being a healthcare innovator, I can empower thousands of doctors to cater to the needs of lakhs of patients. This was the changing point in my life where I left clinical practice and started De Novo," says Dr Mamoria, expressing his gratitude to Venture Center, Pune, for their support.

De Novo Bio Innovations has been extensively working on advanced wound closure and advanced laparoscopy instruments. They have an R&D pipeline of three innovative and patented devices that aim to bring advanced quality devices at affordable rates to cater to the needs of developing countries.

The startup has raised various funds in the form of government grants, private funding, and CSR support. De Novo was also the winner of the Atal New India Challenge (ANIC) 2.0 by Atal Innovation Mission, NITI Aayog which is a Rs 1 crore grant from the government. The startup

has also been part of various accelerator programs like Stanford Seed Spark, AIM Prime, Maha60 Cornell, and RICH-AID.