

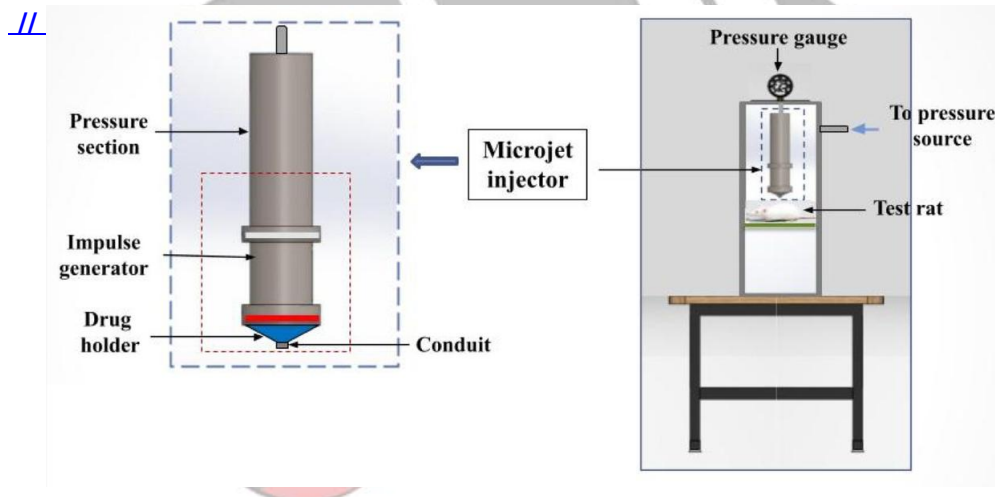


Needle-Free Shock Syringe

[Source: TH](#)

Researchers at **Indian Institute of Technology (IIT) Bombay** have developed a **shockwave-based, needle-free syringe** that ensures painless drug delivery, reducing skin damage and the risk of infection.

- The shock syringe uses **high-energy shockwaves** to deliver drugs through the skin **without the need for needles**, offering a painless alternative to traditional injections.
 - A shockwave is a **pressure wave** that moves faster than sound through a medium like air, water, or solids. It forms when an object or force causes a rapid pressure change, traveling through the surrounding environment.
 - The device consists of three sections: **driver, driven, and drug holder**, which create a **shockwave-driven microjet for drug delivery**.
- The shock syringe is designed with a **micro shock tube** that uses pressurized **nitrogen gas** to create a **microjet of liquid drug**, which travels faster than sound to penetrate the skin.
 - The shock syringe demonstrated effective delivery of drugs in rats, with deeper tissue penetration and minimal skin damage compared to regular needles.
- The shock syringe could speed up **immunization drives like [Mission Indradhanush \(MI\)](#)** and reduce bloodborne disease risks from needle-stick injuries.
 - It is cost-effective, designed for over 1000 uses with only nozzle replacements needed.



Read more: [Incovacc, Intranasal Covid-19 Vaccine](#)