



Medical Studies

Needle-free liquid jet injections: mechanisms and applications.



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Needle-free liquid jet injections: mechanisms and applications.

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Abstract

Liquid jet injections employ a high-speed jet to puncture the skin and deliver drugs without the use of a needle. They have been used to deliver a number of macromolecules including vaccines and insulin, as well as small molecules, such as anesthetics and antibiotics. This article reviews liquid jet injectors with respect to their historical perspective, clinical applications, mechanisms and future prospects. An overview of the use of jet injectors for delivery of vaccines, insulin and growth hormones is presented. Particular attention is paid to the mechanistic understanding of jet injections, especially the dependence of jet penetration on parameters such as nozzle diameter, velocity and jet power. Finally, gaps in the current understanding are presented and suggestions for future research and development are made.

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