

## Jet Injector - An Approach to Painless Dentistry

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### Introduction

Pain management is the most common problem a dentist faces when treating a patient. Instilling a positive dental approach is achieved only by properly handling pain. Various recent advancements have been made in painless anesthetic techniques to enhance the treatment quality concerning pain in dentistry.

### Jet injectors

A jet injector is a drug delivery device that delivers the anesthetic solution under high compression forces to a localized area.

Jet-Injection devices were developed in 1866 for mass immunization and extended to intramuscular and subcutaneous drug delivery. The commonly used jet injector devices are Syrijet Mark II and MED-JET.

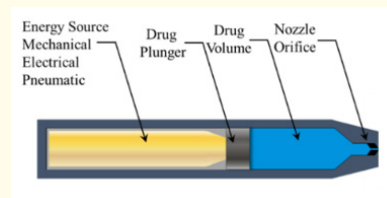
### Parts of a jet injector

The jet injector is made up of

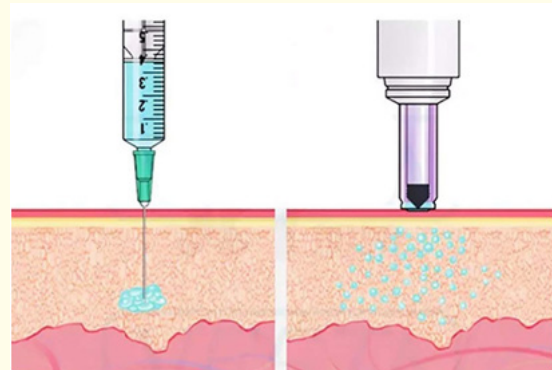
- Piston
- Energy source
- Drug plunger
- Container to load the anesthesia

### Working of jet-injector

When the piston is activated, air pressure is released from the energy source forcing the plunger in a jet motion to create a small puncture in the mucosa to inject the anesthetic solution without a needle to produce surface anesthesia. The jet injectors generate a jet velocity between 100 and 350 m/s that are necessary to break the skin barrier, penetrate the stratum corneum, and deliver the fluid to the subcutaneous tissue.



**Figure a**



**Figure b**

Advantages of jet injectors are

- Rapid action and easy to use.
- Minimum or no pain.
- Less tissue damages.
- Fast drug concentration at the injection site.

Disadvantages of jet injectors are

- Expensive.
- Abrupt noise and pressure sensations by the jet injectors can frighten the patient.
- The invasive appearance of the jet injector.
- Residual hematomas.

So far, the use of jet injectors in dentistry is minimal. However, despite its inadequate clinical evidence, jet injectors are used for placing rubber dam clamps, incision and drainage of abscesses, retraction cords placement, orthodontic bands placement, or space maintainers. Jet injectors have been reported to provide 100% pain control in tooth preparation and procedures like abscess drainage and rubber dam clamp placement: 96.3% successful in pulp therapy, and 83.5% success in tooth extraction.

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