

## Title: Self-adaptive Dental Irrigation Device

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**KEYWORDS:** Root Canal, irrigation, close-loop, self-adaptive

**DOMAIN:** Healthcare device

### SUMMARY:

Dental irrigation is vital to thoroughly clean and remove bacteria, debris, and infected tissue and allow the medicaments' seepage into the canal system during root canal treatment. Additionally, the root canal needs to be cleaned with different chemical irrigants. Syringe irrigation, sonic irrigation, and ultrasonic irrigation are traditional methods that often lack specificity for individual root canal anatomy, and are high-priced and complex to handle.

Self-adaptive closed-loop dental irrigation device uses an advanced working mechanism to control the flow of the irrigants from the outlet needle by sensing the backpressure exerted by the irrigant at the outlet pressure sensor. The back pressure is dependent on both the outlet needle and root canal dimensions, hence the flow is adaptable according to the individual's root canal anatomy. Further, the flow rate and pressure input at each outlet are regulated by the flow and pressure sensor of the microcontroller of the self-adaptive control system. Hence, close-loop dental irrigation can facilitate root canal irrigation in a much simpler and cost-effective manner.

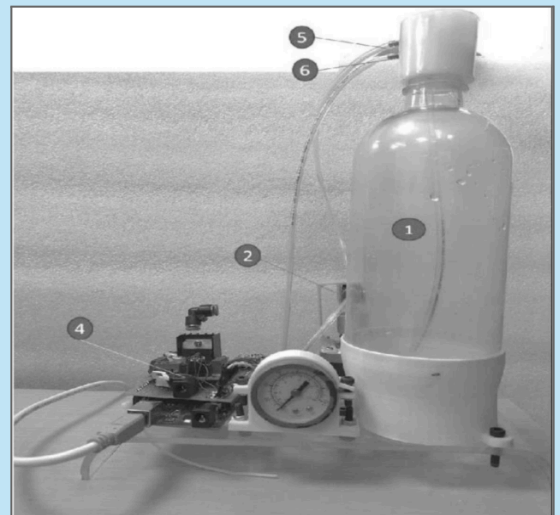


Figure: Prototype of the self-adaptive dental irrigation device

### ADVANTAGES:

1. Cost-effective: Air-pressure regulated system uses economical components compared to electric motor-driven pumps.
2. Offer specificity to individual root canal anatomy.

**APPLICATION:** Root Canal Treatment

**SCALE OF DEVELOPMENT:** Lab-scale prototype available.

**TECHNOLOGY READINESS LEVEL:** TRL 4

**IP STATUS:** Indian Patent Application No. 202311029263