



PhD in Medical Sciences

Research Area: Endodontics

Title: Computational fluid dynamic study on the irrigation of mesial root canals of mandibular molars

The procedures used for infection control during endodontic treatment are usually grouped into three primordial steps, instrumentation, irrigation and obturation. The anatomy of the root canal system presents itself as a common challenge, which, in order to achieve their objectives, cannot be isolated in conceptual and practical terms, since they have synergistic roles. In terms of irrigation, its efficiency depends on its chemical, physical and mode of delivery, which will determine the irrigant dynamic within the root canal system. This dynamic is influenced by factors associated with the irrigation technique used, the size of the instrumentation and the type of anatomy that is addressed.

Computational dynamics of fluids is a methodology that allows predicting the effect of these factors, either alone or in combination, on the flow of the irrigant inside the root canal system, namely on the flow velocity, shear stress, and apical pressure.

Keywords: Endodontic treatment, endodontic irrigation, computational fluid dynamics

Supervisors: Professor Doutor António Ginjeira (Supervisor), Professora Doutora Paula Pascoal-Faria (CDRSP Supervisor)

Start Year: 2016