



## Root canal irrigation: beyond the tsunami

The perceived importance of irrigation on the outcome of root canal treatment has grown considerably over time. Gradually, accumulated evidence indicated that currently available canal preparation instruments are unable to reach many parts of the root canal system. This realisation has triggered a change in the primary aim of root canal preparation. Nowadays, preparation is largely considered a means of providing access to the apical anatomy and allowing irrigants, which are then expected to accomplish most of the cleaning and disinfection<sup>1</sup>.

The paradigm shift took place in tandem with another development in relation to research on root canal irrigation. The focus gradually shifted from smear layer removal to antimicrobial activity and from the types of irrigant to methods of delivery, and ways to enhance their effectiveness within the root canal system. Following decade-long quests to develop better irrigants, eventually it became obvious that even the best irrigating solution would be pointless if it could not reach its targets in the root canal system in sufficient amounts. Thus, improvements to better delivery and agitation of irrigants are also sought.

The renewed interest in root canal irrigation is manifested by the plethora of, mainly in-vitro and ex-vivo, studies that have been published within the last 20 years. New studies are appearing continuously, in keeping with this upward trend. However, conflicting findings have often been reported; not all research methods and models are equally reliable or clinically relevant. The resultant information overload from these studies may confuse clinicians, researchers and decision makers. Hence, the value of focused critical reviews on topics of particular interest cannot be overstated.

When Professor B.S. Chong approached me in late 2017 with the idea to edit a special issue with invited reviews on root canal irrigation, I was

happy to accept the challenge. Reflecting on this decision more than a year later, I must admit that I had underestimated the amount of time and work it would entail. Not only in terms of the author/s or co-author/s needed for some of the reviews but also to find, persuade, coordinate and assist numerous distinguished experts working in different locations around the world.

Informed readers will notice that a number of related topics often mentioned in the literature, especially on certain agitation methods and irrigants, are missing or have only been discussed very briefly in this special issue. At the very beginning, while planning the structure of this issue, a conscious decision was made not to attempt to comprehensively cover, like a textbook, everything on irrigation. Instead, given the abundance of textbooks on the market and the limited pages in a journal, it was decided to concentrate on a few selected topics that would be of special interest to clinicians and researchers and where up-to-date and in-depth reviews were generally lacking. The popularity of the various irrigants and irrigation methods<sup>2-4</sup> guided the selection process. Another conscious decision was to exclude material likely to be subject to manufacturers' influence and to avoid potential conflicts of interest; relying solely on the available, independent evidence, which was then critically appraised and synthesised.

The first article in this issue serves as an introduction and sets the framework on the problems that root canal irrigation must tackle. Luis Chávez de Paz and Ronald Ordinola-Zapata reviewed the challenges imposed by microbial biofilms and the additional protection provided to these biofilms by the complex root canal system anatomy.

The next two review articles are devoted to the two most widely used irrigation methods: syringe irrigation, which has been our clinical standard for

decades, and ultrasonic activation, currently the most popular supplementary irrigation method. Maria Teresa Arias-Moliz, Matilde Ruiz-Linares and Carmen Maria Ferrer-Luque have contributed a comprehensive update on irrigating solutions, their effects inside the root canal system and their interactions. The clinical outcomes of root canal irrigation by various solutions and methods, a common topic of heated discussions among colleagues, are addressed in a separate review by Kishor Gulabivala, Georgios Milesis and Yuan Ling Ng. Finally, the last paper is focused on sodium hypochlorite accidents, the most common mishap related to irrigation, and discusses their aetiology and management. Despite our best efforts, a small amount of information overlap between the reviews was inevitable. Nevertheless, rather than being a disadvantage, interpretation of the same evidence by different experts is beneficial so as to provide readers with a more thorough overview of the topic.

I would like to thank all the colleagues who have contributed to this special issue for their participation, for making time in their busy schedules and for preparing their truly fascinating reviews. I hope this special issue will be stimulating for the readers of ENDO – Endodontic Practice Today.



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