Multiple studies of root canal histology have confirmed its complexity, and its intricate anatomy is being revealed more and more to us, via in vitro and laboratory studies. As new articles are published and new equipment brought to the market, there is one question to be answered: how can we use all this information to develop a comprehensive clinical treatment that is clear to endodontists and to general dentists in order to serve our patient better?

Root canal therapy is a series of steps, where each procedure depends on the previous one:

– Clinical judgement and CBCT are used to evaluate the level of 3-D complexity of the root canal system for proper diagnosis and treatment planning.
– Shaping is performed for cleaning of the main canal, or the space of lesser resistance, where the smear layer produced has to be eliminated via the proper sequence and appropriate technique of chemical preparation in order to open access to all spaces and prevent lateral pushing of the debris, thereby blocking the system (often, we, the practitioners, are responsible for blocking the system and “simplifying” the initially complex anatomy). Ongoing studies have shown that we can accomplish almost a zero bacteria load level via a proper irrigation sequence, using the appropriate timing, volume and chemicals, and this can be accomplished by affordable means and does not require sophisticated and expensive equipment. Chemical preparation is not only used for cleaning the canal system. The latest studies using cryotherapy have shown that it helps reduce postoperative pain at the inexpensive use of cold water at the end of the procedure.
– 3-D obturation sealing of the canal in order to fill what has been cleaned builds on the success of the two previous steps, completes the treatment of the whole complexity of the endodontic system and makes the following restorative steps possible.

A clear understanding of the demands and restrictions of the anatomy, as well as the role of each step in order to treat the root canal system, is essential. Though the temptation may be strong to try what seems an easier route—one file/one chemical/one cone—it is the natural complexity that should be guiding us in how we address it and how we treat it.

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Guest Editor