

## **Irrigation of root canals during endodontic treatment**

*DarvishBasseri Amirhossein AmirHossein*

*Belarusian State Medical University, Minsk*

*Tutor(s) – PhD, associate professor Kolb Ekaterina Leonidovna, Belarusian State Medical University, Minsk*

The major causes of pulpal and periapical diseases are living and nonliving irritants. The latter group includes mechanical, thermal and chemical irritants. The living irritants include various microorganisms including bacteria, yeasts and viruses. When pathological changes occur in the dental pulp, the root canal space acquires the ability to harbor various irritants including several species of bacteria, along with their toxins and byproducts. Investigations in animals and patients have shown that pulpal and/or periradicular diseases do not develop without the presence of bacteria. The main goal of successful endodontics is the elimination of infection and the protection of the decontaminated tooth from future microbial invasion. The only proper irrigation procedure might help to clean root canal system thoroughly.

Investigation of all the possible variants of irrigation protocols in endodontics which are present and being used at current period.

In the study all available sources of literature on irrigation protocols in dentistry have been analyzed. Features of the commonly used materials such as sodium hypochlorite, chlorhexidine, EDTA, citric acid and etc. have been discussed.

It is well recognized that none of the currently available irrigating solutions truly master all of these tasks when convenience and effectiveness are taken into consideration; therefore, use of a minimum of two solutions to complete these tasks is necessary. Sodium hypochlorite is the solution of choice during instrumentation due to its strong antibacterial effect and ability to dissolve organic debris (e.g., necrotic pulp tissue); however, hypochlorite cannot remove smear layer that has formed on canal walls that have been in contact with rotary preparation instruments. Smear layer removal is an important part of the treatment because it contains microorganisms and microbial antigens embedded in the amorphous mixture of inorganic and organic dentin and necrotic tissue. Smear layer has traditionally been removed by 17% EDTA (ethylenediaminetetraacetic acid), and citric acid has also been used for this purpose. QMix 2in1 is a new root canal irrigant built on the effectiveness of EDTA that removes smear layer at least as effectively as 17% EDTA, and has proven to be a highly effective antimicrobial agent ( $\geq 99.99\%$  disinfection per independent studies). It kills planktonic (free-floating) bacteria, including Enterococci, within seconds, and research shows it is capable of penetrating biofilms due to its unique blend of antibacterial substances and their combined synergistic effect. QMix™ 2in1 is a premixed, ready-to-use, colorless and odorless solution that is free of antibiotics. No evidence of tooth staining has been observed in laboratory conditions following use of this solution.

Hypochlorite irrigation during instrumentation dissolves the organic matter in smear layer, and EDTA removes the inorganic substance, revealing a clean canal wall with open dentinal tubules; however, EDTA lacks the antibacterial effect that is highly desirable when removing the smear layer. Recent observations of the effect of hypochlorite on dentin (weakening, erosion) suggest caution regarding the use of hypochlorite as the final rinse after EDTA. QMix 2in1 is a new root canal irrigant which might be very effective for disinfection of root canal system .