

# Irrigation Trends among Endodontists in Saudi Arabia

Mohammed Waseem<sup>1</sup>, Omar Alhindi<sup>2</sup>, Nail Alanazi<sup>3</sup>, Turki Dahman<sup>4</sup>, Rakan Alsubaity<sup>5</sup>, Abdullah Riyadh<sup>6</sup>

**Abstract:** ***Aim:** The purpose of this study is to determine current trends in irrigation selection among Endodontists. **Methods:** Survey participants were asked 14 questions based on their individual responses. Among other questions, participants were asked about their irrigant selection, irrigant concentration, smear layer removal, and use of adjuncts to irrigation, **Results:** Our data indicate that >91% of respondents are using sodium hypochlorite as their primary irrigant, Most endodontists surveyed (56%) use full-strength sodium hypochlorite (NaOCl concentration >5.0%) Seventy-seven percent of respondents aim to remove the smear layer during endodontic treatment. Almost half of all respondents use an adjunct to irrigation with 44% using ultrasonic activation and 36% using sonic (or subsonic) activation. **Conclusion:** Most of the respondents are using full Strength sodium hypochlorite and are routinely removing the smear layer during endodontic treatment. In addition, almost half of the respondents are using an adjunct, such as ultrasonic activation, to aid in their irrigation technique.*

**Keywords:** Endodontic, Irrigation

## 1. Introduction

Even with modern techniques that use nickel-titanium files, more than 35% of the root canal's surface can be left uninstrumented after nonsurgical root canal treatment (1). To remove debris and address these uninstrumented surfaces, it is necessary to copiously irrigate the root canal (2). The ideal root canal irrigant has been described by Zehnder (3) as being systemically nontoxic, non caustic to periodontal tissues, having little potential to cause an anaphylactic reaction, possessing a broad antimicrobial spectrum, capable of dissolving necrotic pulp tissue, inactivating endotoxins, and either preventing the formation of a smear layer or dissolving it once it has formed. Many irrigating solutions have been studied extensively to determine which best exhibit these ideal properties, but the ideal irrigant has not yet been realized. Sodium hypochlorite is able to meet many of these criteria. It has a broad antibacterial spectrum, while also possessing some ability to inactivate endotoxin (4–6). Unlike other irrigants, it is effective at dissolving tissue and removing the organic component of the smear layer (7, 8). Although many authors suggest dilution of NaOCl to limit its cytotoxicity, some studies indicate that NaOCl might lose some of its antibacterial effectiveness and tissue-dissolving capability when it is diluted from a full-strength solution (9). Because of its irritating properties and the potential for severe inflammatory reactions, efforts have been made to find alternatives to NaOCl irrigation.

## 2. Aim(s) of the Research

The purpose of this study is to determine current trends in irrigation selection among endodontists in Saudi Arabia.

## 3. Materials and Methods

**Study design-** A cross sectional study will perform using a questionnaire as a survey.

**Study population** – Practicing Endodontists in Saudi Arabia

**Sample size** - 100.

**Sample selection** – Convenience sampling.

**Duration of study**—3 months.

**Informed consent** – Obtained from Practicing Endodontist.

Survey participants were asked 14 questions based on their individual responses. Among other questions, participants were asked about their irrigant selection, irrigant concentration, smear layer removal, and use of adjuncts to irrigation. Questions consisted of numeric rankings, multiple choice, and multiple selections with options for write-in answers where appropriate.

Data were collected and analyzed by using Question Pro software.

## 4. Results

There were 100 participants, with an overall completion rate of 100% (n = 100). Responses were received from among the different groups based on years since graduation from dental school and endodontic residency training. Among all year groups, our data indicate that >91% of respondents are using sodium hypochlorite as their primary irrigant. When asked to rank the reasons for their primary irrigant selection, antibacterial capability was most important, followed in order by tissue dissolution, biocompatibility, substantivity, and expense. The majority of respondents are also including EDTA (80%) and CHX (56%) in their endodontic practice (Fig. 2). Most endodontists surveyed (57%) use full-strength sodium hypochlorite (NaOCl concentration >5.0%). Seventy-seven percent of respondents aim to remove the smear layer during endodontic treatment. Most endodontists (66%) will not alter their irrigant selection on the basis of pulpal or periapical diagnoses. Almost half of all respondents use an adjunct to irrigation, with 48% using ultrasonic activation and 34% using sonic (or subsonic) activation. Ten percent of those surveyed are also using negative pressure irrigation with systems such as EndoVac.

## 5. Discussion

Much research has been conducted to determine which irrigants most closely adhere to the ideal properties of such a medicament. It is beyond the scope of this article to address the many studies that evaluate and compare the antimicrobial efficacy of various solutions. In a survey conducted in North Jordan, it was found that only 32.9% of

general dentist respondents used sodium hypochlorite and 33.6% used hydrogen peroxide during root canal treatment (22). A survey conducted in Australia reported that 94% of endodontists used sodium hypochlorite, with 80% of those surveyed using a 1% NaOCl solution (24). In this study, it was found that the overwhelming majority of respondents (91%) use sodium hypochlorite as their primary irrigant, with 57% of them using a concentration of 5% or greater. This irrigant selection satisfies our survey's highest ranked 2 reasons for irrigant selection; it is both antibacterial and tissue-dissolving. The differences between our results and previous surveys regarding primary irrigant selection might be attributed to regional differences because our study was limited to Endodontists. A previous survey among members of the American Association of Endodontists in 2001 revealed that 51% of practicing endodontists removed the smear layer before obturation of the root canal system (25). This differs from the results of our study that indicate 77% of endodontists routinely aim to remove the smear layer. Because the survey questions were worded similarly and addressed to the same contingent, it is quite possible that the results from our research reveal a slight change in treatment philosophies. Although 34% of respondents in our study stated that their choice of irrigant might change on 6 the basis of pulpal and periapical diagnosis, when asked concerning various diagnoses, their primary irrigant was still overwhelmingly sodium hypochlorite. These answers should be interpreted with caution because the questions were not open-ended and did not allow protocols with multiple irrigants to be considered. In our study, almost half of all respondents are using some form of adjunct, with 48% using ultrasonic activation, 34% using sonic (or subsonic) activation, and 10% using a negative pressure system. These results indicate the desire of many endodontists to improve irrigation efficacy by using other means to bring irrigants into contact with the root canal walls.

## 6. Conclusions

Most of the respondents are using full Strength sodium hypochlorite and are routinely removing the smear layer during endodontic treatment. In addition, almost half of the respondents are using an adjunct, such as ultrasonic activation, to aid in their irrigation technique.

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