

# COMPLIANCE WITH THE USE OF PERSONAL PROTECTIVE EQUIPMENT AMONG DENTISTS WORKING AT THE ROYAL MEDICAL SERVICES

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## ABSTRACT

**Objective:** The assessment of compliance with using personal protective equipment among a group of military dentists.

**Methods:** A self-administered questionnaire was distributed to a total of 100 military dentists. The questionnaire comprised of two parts. The first included five general questions related to the duration of dental experience, gender, professional rank, frequency of recording medical history of patients, in addition to the availability of infection control policy in their departments. The second part was further subdivided into four sections concerned with the use of different personal protective equipment including masks, white coat, gloves and protective glasses.

**Results:** Of the total 100 questionnaires, the response rate was 87%. The majority of the dentists were male general practitioners. Only 57 (65.5%) of them recorded the medical history routinely and only 12 (13.7%) had an infection control policy in their department. The majority of the above mentioned dentists (94.2%) always wore gloves but only 81.6% of them changed their gloves after each patient. About 67.8% of the dentists always wore masks while treating their patients but only 10.3% of them changed the mask after each patient. Most of the dentists (97.7%) wore white coats and approximately half of them (50.57%) never used eyeglasses or protective face shields.

**Conclusion:** Military dentists show good compliance with the use of personal protective equipment; however, some dentists do not utilize the full range of infection control procedures. The development of an infection control manual, in addition to continuous education with adequate supplies of personal protective equipment are necessary to reduce the risk of cross infection in dental clinics.

**Key words:** Infection control, Personal protective equipment

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## Introduction

Infection control procedures are essential for all health care providers. Dental health-care personnel

(DHCP) refers to all personnel in the dental health-care setting who may be occupationally exposed to infectious materials, including dentists, dental hygienists, dental assistants, dental laboratory

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technicians, students and trainees. Personal protective equipments (PPE) are designed to protect the skin and the mucous membranes of the eyes, nose, and mouth of DHCP from exposure to infectious agents. Use of rotary dental and surgical instruments and air-water syringes creates a visible spray that contains primarily large particle droplets of water, saliva, blood, microorganisms, and other debris.<sup>(1)</sup> Wearing gloves, surgical masks, protective eyewear, and protective clothing in specified circumstances to reduce the risk of exposure to blood borne pathogens is mandated by Occupational Safety and Health Administration's (OSHA) in the U.S.<sup>(2)</sup>

Infection control practices in developing countries have not been widely documented. In Jordan, the compliance with infection control programs in private dental clinics was investigated; the authors concluded that there was a great need to provide formal and obligatory infection control courses to private dentists in addition to distribution of infection control manuals that include the current infection control guidelines.<sup>(3)</sup> The objective of this investigation was to evaluate the compliance with the use of personal protective equipment among a group of military dentists during their everyday clinical practice.

## Methods

A total of 100 dentists working at different hospitals and clinics of the Jordanian Royal Medical Services attended an educational workshop concerned with infection control in dental practice. At the beginning of the workshop, dentists were asked to complete self administered-questionnaires. The questionnaire comprised of two parts. The first included five general questions related to the duration of dental experience, gender, professional rank, the frequency of recording medical history for the patient, and the availability of infection control policy in their departments. The second part was further subdivided into four sections concerned with different personal protective equipment including mask, lab coats, gloves and protective glasses. The section concerned with gloves consisted of six questions regarding the availability and frequency of using gloves in their professional work, in addition to any malpractice related to the usage of gloves such as using examination gloves for surgical procedures and vice versa. The mask part consisted of three questions concerned with the usage,

availability and frequency of changing the mask during everyday clinical practice. Similar questions were used to assess the use of white coats, protective glasses and face shields. The original questionnaire also included other aspects of infection control (such as hand hygiene, patient care equipment etc.) but these items were not included within the present investigation.

## Results

Eighty-seven out of 100 dentists responded to the questionnaire. Data regarding gender, dental experience and professional rank are presented in Table I, which shows that the majority of the dentists were male general practitioners. Our results also show that the medical history of patients was recorded routinely only by 57 (65.5%) of the dentists while the remaining 30 dentists (34.5%) recorded it occasionally. The results of this study also show that only 12 (13.7%) dentists had an infection control policy in their departments.

Compliance of the dentists regarding wearing gloves revealed that the majority of dentists (94.2%) wore gloves always and 81.6% of them changed their gloves between patients. The results also revealed that some dentists use surgical gloves for routine examination or vice versa. A deficiency in the supply of gloves, in terms of quantity and size, in some departments also exists (Table II).

**Table I.** Distribution of dentists regarding their dental experience, professional rank and gender

	No. of Dentists	%
<b>Dental experience</b>		
1-5 years	29	33.33
6-10 years	31	35.63
11-15 years	22	25.26
> 15 years	5	5.74
<b>Professional Rank</b>		
General Dental Practitioner	49	56.32
Resident	23	26.43
Senior resident	4	4.59
Assistant Specialist	4	4.59
Specialist	7	8.04
<b>Gender</b>		
Male	55	63.21
Female	32	36.78

**Table II.** Number and percentage of dentists and glove usage

	No. of Dentists	%
<b>Frequency of using gloves</b>		
Always	82	94.25
According to the case	5	5.75
<b>Frequency of changing gloves</b>		
After each patient	71	81.6
After more than one patient	16	18.4
<b>Availability of gloves for each patient</b>		
Yes	71	81.6
No	16	18.4
<b>Availability of a proper size of gloves</b>		
Always	17	19.54
Occasionally	65	74.71
Never	5	5.74
<b>Use of surgical gloves for routine dental examination</b>		
Yes	21	24.14
No	66	85.86
<b>Use of sterile gloves for surgical procedures</b>		
Yes	69	79.31
No	18	20.69

**Table III.** Number and percentage of dentists and mask use

	No.	%
<b>Frequency of mask wear</b>		
Always	59	67.81
According to the case	27	31.03
Never	1	1.14
<b>Do you always have enough masks</b>		
Yes	74	85.05
No	13	14.95
<b>How frequently do you change your mask</b>		
After each patient	9	10.34
After more than one patient	37	42.52
If it becomes wet	9	10.34
At the end of the clinical session	34	39.08

The results of the present investigation also show that the majority of the dentists 59 (67.8%) always wore masks while treating their patients, however only nine (10.3%) of them changed their mask between patients. Some shortage in the supply of masks was also noticed in our results (Table III). Approximately half of the dentists (n=44, 50.57%) never used eyeglasses or protective face shields

because they had never been supplied these by the department (Table IV).

The majority of dentists (97.7%) wore white coats. However, only two dentists changed their coats daily while the majority changed weekly or after few days. In addition, 31 (35.64%) dentists do not take-off their coats upon leaving the clinic. Some dentists laundered their coats at home without taking any precautions (Table V).

**Table IV.** Number and percentage of dentists and their compliance with using protective glasses or face shields

	No.	%
<b>Use protective glasses or face shields</b>		
Always	15	17.24
According to the case	28	32.18
Never	44	50.57
<b>Cleaning or disinfecting glasses or shields after each patient</b>		
Always	11	25.6
Occasionally / when visibly soiled	32	74.4
<b>Opinion if face shield can substitute:</b>		
Masks	9	10.34
Protective glasses	24	27.58
Both	30	34.48
None	24	27.58

**Table IV.** Number and percentage of dentists and their compliance with wearing white coats

	No.	%
<b>Wearing white coats</b>		
Yes	85	97.7
No	2	2.3
<b>Taking off your coat upon leaving the clinic</b>		
Yes	56	64.36
No	31	35.64
<b>Frequency of changing coat</b>		
Daily	2	2.29
Every few days	42	48.27
Weekly	40	45.97
Only when contaminated	3	3.44
<b>Place of laundering coat</b>		
Hospital	40	45.97
Home with precautions	39	44.82
Home without precautions	80	9.19
<b>Availability of disposable gowns for surgical procedures</b>		
Yes	21	24.13
No	66	75.87

## Discussion

Primary PPE used in oral health-care settings includes gloves, surgical masks, protective eyewear, face shields, and protective clothing. DHCP wear gloves to prevent contamination of their hands upon contact with mucous membranes, blood and saliva, and also to reduce the likelihood that microorganisms present on the hands of DHCP will be transmitted to patients during surgical or other patient-care procedures.<sup>(1)</sup> Gloves are also very essential to prevent occupational dermatitis that may occur as a result of the ability of some dental materials, polymeric ones in particular, to penetrate gloves.<sup>(4)</sup> Latex sensitivity may also cause occupational dermatitis,<sup>(5)</sup> however, this issue was not considered in this study.

Military dentists in this investigation showed good compliance with use of gloves (94.2%), comparable to that of Canadian dentists which was found to vary between 93-100%,<sup>(6)</sup> and much more higher than the 70% reported for the general dental practitioners in UK with only 14.5% of them using new gloves for each patient.<sup>(7)</sup> An investigation about the use of protective gloves among Swedish dentists also revealed good compliance with using gloves.<sup>(8)</sup> This study also reported that female dentists used gloves more frequently than males<sup>(8)</sup> however, this issue was not investigated in the present study.

Medical gloves, both patient examination and surgeon's gloves, are manufactured as single-use disposable items that should be used for only one patient, then discarded. Gloves should be changed between patients and when torn or punctured.<sup>(8)</sup>

This study revealed several negative points regarding glove use. Firstly, 5.7% of the dentists wore gloves depending on case type and not on a regular basis. Secondly, 18.4% of the dentists used the same gloves for more than one patient and thirdly, about 24% of dentists used surgical gloves for routine dental examination and treatment while about 21% of the dentists used non-sterile examination gloves for surgical dental procedures. These finding could be explained in part by the fact that there is some shortage in the supply of gloves in terms of quantity, type and size in some dental departments. This may lead the dentist to use surgical gloves for routine treatment or vice versa. It was found that non-surgical dental extractions could be safely performed with the surgeon wearing clean, non-sterile gloves.<sup>(9)</sup>

Surgical masks and eye protection with solid side shields or face shields should be used to protect mucous membranes of the eyes, nose, and mouth during procedures likely to generate splashing or spattering of blood or other body fluids.<sup>(1)</sup> The results of this study revealed that the percentage of dentists who always wore masks comprised 67.8%. The compliance with using masks among dentists across Canada varied between 50-100%,<sup>(6)</sup> and among dentists working in the private sector in Riyadh was 90.6%.<sup>(10)</sup> The mask's outer surface can become contaminated with infectious droplets from spray of oral fluids or from touching the mask with contaminated fingers. The resistance to airflow through the mask increases, causing more airflow to pass around the edges of the mask when the mask becomes wet from exhaled moist air. If the mask becomes wet, it should be changed between patients or even during same patient treatment when possible.<sup>(2)</sup> While masks may be used to protect the operating team from blood or airborne infections, they have not been proven to protect the patient.<sup>(11)</sup>

A face shield may be a substitute for protective eyewear but not for a mask.<sup>(12)</sup> This fact was known only to 27.5% of the dentists in this study. Only 17.2% of the military dentists in this study always wore protective glasses or face shields, but 74.4% of them cleaned their glasses or shields occasionally and when visibly soiled. All PPE should be removed before DHCP leave patient-care areas.<sup>(2)</sup> Reusable PPE (e.g. clinician or patient protective eyewear and face shields) should be cleaned with soap and water, and when visibly soiled, disinfected between patients, according to the manufacturer's directions.<sup>(2, 12)</sup>

Infection control guidelines according to the organization of safety and asepsis procedures (OSAP) in the United States stated that gowns or jackets worn, as protective attire should be changed at least daily, or more often if visibly soiled. Protective gowns or covers must be removed before leaving the work area. Protective attire may not be taken home and washed by employees. It may be laundered in the department if equipment is available and universal precautions should be followed for handling and laundering contaminated attire. Disposable gowns may be used but must be discarded daily or more often if visibly soiled.<sup>(12)</sup> This study showed good compliance of military dentists with using white coats, the majority of them changed their coats weekly or within a few days, in

addition 35.6% of the dentists did not take of their coats upon leaving the clinic.

It is well known that dentists should follow infection control guidelines, furthermore dentists have the responsibility to ensure that information on infection control measures is disseminated as widely and as clearly as possible so that undue public concern and avoidance of dental care are minimized.<sup>(13)</sup>

## Conclusion

Military dentists working at the Jordanian Royal Medical Services show good compliance with the use of personal protective equipment; however, some dentists don't utilize the full range of infection control procedures. The development of an infection control manual in addition to continuous education with enough supply of personal protective equipment are necessary to reduce the risk of cross infection in dental clinics.

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