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Review Article

# The Perils of Continuous Wearing of False Eyelashes in Clinical Settings

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## Abstract

Dental and medical providers work hard to provide the best care for patients while avoiding risk-bearing practices. Healthcare professionals, performing or participating in the operative process, are aware that it is essential to adhere to aseptic practices in intraoperative settings. Wearing false eyelashes while participating in clinical and surgical services may be a gateway for possible infection. This paper explores the question if wearing false eyelashes in clinical settings is appropriate and it will also highlight implications for providing care using aseptic techniques in operative settings. Is wearing false eyelashes while performing clinical procedures an opportunity to increase the likelihood of infections caused by false eyelashes germs? This paper also assesses the rationale for healthcare professionals to wear false eyelashes while performing clinically-related procedures.

**Keywords:** False Eyelashes; Fake Eyelashes; Falsies and Complications; Wearing False Eyelashes and Clinical Procedures; Adverse Outcomes and Eye Infections

## Introduction

Women and anyone seeking beautiful eyes have longed for and sought out the perfect set of eyelashes that fulfill all beauty and esthetic desires. Eyelashes that are long, thick, full, and remarkably enhance their beauty and can often be associated with a heightened level of appeal, assurance, and improve self-esteem [1]. Artificial eyelashes or "falsies" can be individually placed as or as strip adhering to the dermal margin of the eye with lash glue [2]. The use of eyelash extensions "falsies" can put the patient and the healthcare provider at risk for an infection, contamination of a sterile field or it can create a situation which potentially disrupts the flow of clinical operations [3,4]. Appropriate management of a safe, clean operative field and is just as significant as performing a high-quality procedure [5]. Maintaining a sterile environment during surgical procedures in dentistry and medicine is paramount.

One key objective for the healthcare practitioner is to minimize the number of microbes of which the patient is exposed. The wearing of false eyelashes during surgical procedures can also be a source of exposure to various infections [6].

### Clinical settings and wearing artificial eyelashes.

In the typical dental office setting, microbial aerosols are repeatedly suspended in the air as a result of dental treatment utilizing high-speed handpieces and water-air spray syringe systems on a series of patients daily. Aerosol dispersion depends on many factors including: the actual size of the particles, composition and ventilation of the area, and the distance and time at which the particles travel and remain suspended [7]. This dispersion of aerosols and direct contact with aerosols can be a conduit for bacterial harvest due to the nature of fake eyelashes. False eyelashes can be made of mink, human hair, or silk. Falsies are composed of polybutylene terephthalate, a synthetic plastic resin that is used in cosmetics that can be disintegrated by bacterial hydrolases. Formaldehyde, a toxic irritant of which bacteria is attracted to, was found in eyelash extension glue [2]. The longevity and incubation of bacteria in these fake lashes can increase the likelihood of infections.

Healthcare teams must eliminate this risk by taking precautionary measures in hopes of stopping the spread of viruses [1,2,6].

Pure air-water mists may commonly splash in the eyes, and even splash around the sides of their eyewear [8,9]. Further studies are needed to determine the method of spread of eyelash bacteria, mites and other viruses that may transmitted to clinicians and/or patients [8,10]. Aerosols generated during dental treatments can remain suspended in the air for a prolonged period, potentially promoting microbial growth, of which may occur along the surface of false eyelashes [8].

## Pathogenesis

Additionally, false eyelashes may be a breeding area for viruses and other parasites [11-13]. False eyelash transmission may also occur through tears and by touching the eyes with hands or fingers. Koffuor et al. noted that the eyelash extension could irritate the eyelid or clog follicles in the eyelid, as well as pull out eyelashes during removal [1,14,15]. The lack of thorough washing of the eyelids when individuals wear false eyelashes may result in bacterial or fungal infections as seen in some eyelid diseases. Adverse effects such as tear film destabilization, mechanical trauma, debris-deflecting functions and toxicity may lead to dry eye disease and inflammation. Open wounds may be an entry point for pathogens and are an infection risk [16].

*Demodex (Demodex folliculorum and Demodex brevis)* is a genus of mites known to reside commonly in human hair follicles [17]. They can be found in the sebaceous glands of the scalp, face, and ears, and in glands of the eyelids and eyelash follicles, where they anchor themselves to the follicle head [10,17]. A high density of *Demodex* infestation has been implicated in a variety of ocular surface conditions such as blepharitis [2], and inflammation of the eyelids that can cause burning or itching sensations, redness and scaling [10]. *Demodex*, a parasite has been implicated in a variety of ocular surface conditions such as blepharitis, and inflammation of the eyelids that can cause burning or itching sensations, and redness [10,17]. Wearing falsies for more than 3 days may increase risk of these complicating symptoms, and increases the chance of finding mites along the eyelash surface [2].

Several research studies assessed *Demodex* on eyelashes [2,13]. The *Demodex folliculorum* was manually counted under the microscope and the researchers were able to document that each eyelash of a blepharitis patient had the parasite. An experiment was done by The Department of Dermatology at Johns Hopkins University to find suitable treatment for blepharitis [18]. It was noted *Demodex* mites were also considered a cause of blepharitis. The mites infested the eyelid margin around the lash follicles and sebaceous glands. Thus, wearing eyelashes can increase a harmful bacterial-laden environment and result in an infection [12]. In a study by Hasegawa et al. ultimately confirmed the incidence of *Demodex folliculorum* on eyelashes. This experiment aimed to find suitable treatments for blepharitis and did so by directly measuring the symptoms of blepharitis on randomized patients with blepharitis [13]. It was again noted that *Demodex* mites were considered a causative factor for blepharitis [18]. The mites, which infest the eyelid margin around the lash follicles and sebaceous glands, may play a role in both anterior and posterior blepharitis [18]. Several studies supported theories about eyelash extensions and the harm that bacteria and *Demodex folliculorum* can cause and effect general health [1,19].

## Adverse effects of wearing eyelashes

The role of eyelashes in possibly harboring and disseminating microorganisms should not be minimized [20,21]. Bacteria were found along the skin surface of the eyelid. This shows that mites may be able to inflict significant damage to the habitat in which they live. Mechanically mites may block the hair follicle and sebaceous duct to induce epithelial hyperplasia and\or hyperkeratinization. Mites may act as vectors to bring in bacterial flora. *Staphylococcus albus* was shown to be transported by mites, and was observed under scanning electron microscope, in which the mites transported the bacteria from follicle to follicle [10]. Superantigens produced by *Streptococci* and *Staphylococci* that were implicated in a number of diseases may play a role [10]. Wearing false eyelashes to bed or for more than a day can cause bacteria to collect under the eyelash glue, and on the false eyelash itself [22,23,24]. Ocular problems are also related to the adhesive agents which may contain formaldehyde [22].

Adverse effects of wearing false eyelashes have varied results such as chronic inflammatory occurrences, particularly for those individuals wearing eyelashes for a long time or those who do not wash their eyelashes [10,25]. Individuals who have compromised immune systems are also more prone to eye infections. Additionally other adverse reactions may occur such as chemical conjunctivitis, pain and dermatitis [22,25].

Thus, there is a chance for ocular complications, when rubbing the eyes prior to dental or medical procedures or post-operatively. Not wearing eyelashes while providing dental or medical procedures can reduce the rate of transmission of bacterial and viral spread and can minimize eye epithelial and periocular stress [25]. It is well known that many infections in clinical settings may derive from resident flora, which are microbes that live deep in the crev-

ices of the skin, in hair follicles and sebaceous glands [25]. It is best to minimize the wear of all false eyelashes which may have contaminates that can interrupt the sterile field and cause risk of infection for the clinician and possibly the patient.

## Conclusion

In conclusion we submit that the wearing of false eyelashes during open procedures in dental medical, or surgical environments is fraught with the risk of infection. More studies should be done that can quantify the level of risk and what other preventive measures can be taken. The current literature sufficiently describes numerous risks of wearing false eyelashes. Surgical and Dental departments may benefit from evaluating additional phenomena in their settings. Clinicians need to be concerned about safe practices, in addition to ocular health and vision outcomes.

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