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Infection prevention and control in optometric practice

ABSTRACT

Infection prevention and control procedures in optometric practice are essential to protect both the optometrist and the patient from infection. With the expanded scope of optometric practice in South Africa, the use of certain techniques and procedures may increase the risk for transmission of infections. The use of appropriate office hygiene procedures and universal precautions to prevent exposure to and/or transmission of disease are presented in this article. The article concludes by recommending to the Professional Board for Optometry and Dispensing Opticians (PBODO) that guidelines on infection prevention and control be published as part of the code of conduct for optometrists undertaking clinical care.

Key words: Infection, infection control, sterilization, vaccination, universal precautions, disinfection

INTRODUCTION

Microorganisms such as bacteria, viruses and fungi, are tiny life forms that can only be seen with a microscope and are found in the environment, dust, dirt and body fluids. Although most microorganisms have beneficial effects for humans, such as in digestion and the recycling of waste, some can cause problems when they become too many or spread to places in which they should not be. Patients may present to the optometrist in practice with an infectious illness, either knowingly or unknowingly, and pose a risk of cross infecting the optometrist or passing on the infection to other patients through use of optical devices. Optometrists themselves may also be harbouring infectious disease, which they may be at risk of passing on to their patients. In addition, the practice environment may pose a microbiological hazard and infection risk to both staff and patients. The main routes through which infections may be transmitted are through physical contact, contact with body fluids and via airborne particles.

Although the risk of transmission of blood borne viruses (e.g. HIV, hepatitis B and C) in optometric practice is low, the risk of transmission of skin infections (e.g. staphylococcus, herpes simplex, or enteric infections) is more likely, and ophthalmic infections (e.g. bacterial and adenoviral conjunctivitis) are more common¹. Most optometric procedures are considered to be low risk for the transmission of disease. However, under some circumstances, such as when instruments coming into direct contact with an infected patient, when exposure to blood occurs, or when cultures are taken, there is the potential for the transmission of disease. There is therefore a need to treat all patients in a uniform manner, including the use of universal infection control precautions.

HAND WASHING

Hand hygiene is one of the most effective ways to control the spread of infection. Mandatory hand washing is recommended before and after examinations and procedures, as many eye diseases are manually transmittable.

There are two ways to keep hands clean and reduce the risk to patients and the optometrist. Firstly, social hand washing with liquid soap is indicated before and after patient contact, before eating, after cleaning equipment and secondly, after using the toilet.

Hygienic hand wash with antiseptic hand cleaner, such as chlorhexidine, is indicated before and after contact lenses patients, after contact with contaminated articles, as well as before and after dealing with patients with known infectious agents¹. Cuts and abrasions should be covered with a waterproof plaster, nails should be kept short and clean, and artificial nails should be avoided, as they are a reservoir of gram-negative bacteria even after hand washing¹. The use of moisturizers is recommended to avoid dryness that can lead to breaks in the skin. The soap or antiseptic should be dispensed into cupped hands, which should be rubbed vigorously and thoroughly for 10-15 seconds without adding more water. Bar soaps and non-disposable towels should not be used in a clinical setting.

PERSONAL PROTECTIVE EQUIPMENT

Medical gloves protect the skin from contamination by microorganisms during patient evaluation¹. For example, it may be necessary to handle the eyelids or surrounding facial tissue, thus bringing the examiner into contact with potentially infected surfaces. Certain patients and workers may be sensitive to latex allergens, which should be taken into consideration when choosing medical gloves, as they can cause either type 1 or type 4 allergic reactions, including anaphylactic reaction that can be fatal²⁻⁴. Powder used in powdered examination gloves can also be toxic to body tissues⁴, and it is therefore recommended that all medical gloves be powder-free^{2,5}. Hands should always be washed after removing the gloves. Although gowns are not necessary for routine optometric procedures, masks may be necessary to protect the patient if an optometrist or a staff member is infected with a pulmonary or other disease that is transmittable via airborne means¹. Disposable plastic aprons can protect the optometrist's uniform or clothes from contamination with blood or other infectious material¹. Protective eyewear is usually unnecessary. However, face and eye protection, such as goggles or face visors, protect the optometrist's face in situations of splashes of hazardous liquid or infected blood or body fluid. A respiratory protection, for example a particulate filter respirator (PFR), protects the optometrist from breathing in infectious airborne particles¹.

HANDLING OF SHARP INSTRUMENTS

Precautions should be taken to prevent injuries caused by needles, syringes, or other sharp instruments¹. In case of accidental inoculations, the area should be washed with soap and running water, and the injury encouraged to bleed freely. Sucking of the wound should be avoided and a waterproof dressing should be applied¹.

In the case of intact-skin exposure, the area should be washed immediately with hot soapy water. Non-intact skin exposure should follow similar steps as inoculation injury, while mucous membrane exposure to the mouth should be washed out with copious amounts of water and those to the eyes should be irrigated with sterile water¹. It is essential that first aid is carried out quickly for all needle-stick injuries.



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INSTRUMENT CLEANING

Cleaning involves the removal of organic and inorganic debris from a surface that might support micro-organisms and provide insulation that reduces the efficiency of disinfecting or sterilisation procedures. Detergents and ultrasonic cleaners are frequently used for cleaning purposes and the equipment should not come into close contact with mucous membranes or sterile body areas e.g. trial frames and refractor heads need to be cleaned¹.

INSTRUMENT DISINFECTION

Instruments that come in close contact with body surfaces of intact mucous membranes, such as tonometer heads, gonioscopes and fundus contact lenses, should be wiped and disinfected by chemicals (3% hydrogen peroxide, 0.5% sodium hypochlorite or 70% ethanol or isopropyl alcohol)¹. These devices should be rinsed thoroughly with sterile saline and air dried before reuse.

INSTRUMENT STERILIZATION

Sterilization is a treatment that completely kills or removes all kinds of micro-organism including spores. It can be achieved by ionising radiation, gaseous ethylene oxide, low stream pressure, dry heat or moist heat (Autoclave)¹. Sterilization is suitable for equipment introduced into a sterile body area or in contact with a break in the skin or mucous membrane.

CONTACT LENS DISINFECTION

Contact lens fitters should be familiar with all infection prevention and control guidelines, including proper hand washing and disinfection techniques for in-office use. Trial contact lenses should be disinfected after each use by chemical/hydrogen peroxide or heat disinfection. However, the best practice is the use of single-use trial lenses. Wherever practicable, a contact lens or ophthalmic device that comes into contact with the ocular surface should not be used on more than one patient. Where it is impractical, suitable items should be decontaminated using a recognized method. Soft contact lenses can be disinfected with an approved hydrogen peroxide system, and some soft lenses can also be heat disinfected¹. Gas-permeable lenses can be disinfected with hydrogen peroxide system but not with heat due to the possibility of warping. Hard (PMMA) lenses can be disinfected with hydrogen peroxide system and most can be heat disinfected using the standard heat treatment regimen used for soft lenses (78 to 80° C) for 10 minutes¹. Hydrogen peroxide is the only recommended and approved disinfection system for HIV⁵. Shoff *et al*⁶ showed that multipurpose system and hydrogen peroxide have reduced ability to kill *Acanthamoeba*.

SPILLAGES

Spillages should be cleared up immediately using gloves and aprons, with paper towels being used to absorb the liquid. The use of sodium hypochlorite for blood spills is recommended, and the area should be cleaned with detergent and hot water¹.

GENERAL CLEANING

All surfaces used as a preparation area for dealing with patients must be cleaned regularly. Surfaces should be cleaned with detergent and water, and those contaminated with body fluids surface should be cleaned with detergent and water followed by a chlorine-based disinfectant¹. All consulting rooms should have access to a wash hand basin and it is good practice for this to be within the consulting room.

CONCLUSION

Workplace infections add to the cost the healthcare industry every year. However, it is possible to significantly reduce the rate of healthcare-associated infections in an optometric practice through effective infection prevention and control measures. Understanding and knowing how and when to apply the basic principles of infection prevention and control is critical to the success of an infection control programme. This responsibility applies to everybody working and visiting an optometric practice, including administrators, staff and patients. Implementing infection control practices in a workplace can break the chain of infection and minimize illness in the office, creating a better working environment. The Health Professions Council of South Africa's (HPCSA) main mandate is to regulate the profession and protect the public. Through its board, Professional Board for Optometry and Dispensing Opticians (PBODO), it has published a number of registration standards, codes and guidelines to provide guidance to the profession. Effective infection prevention and control for optometrists should be part of the Board's code of conduct to minimize the risks to patients and the associated costs to the healthcare system from poor infection control practices. The author recommends that the HPCSA, through its professional body, the PBODO, sets infection prevention and control guidelines for optometrists and monitor compliance to the guidelines.

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