

**UNIVERSITI TEKNOLOGI MARA (UiTM)**

**INNOVATIVE DESIGN OF CONTACT LENS CASE  
TO REDUCE MICROBIAL CONTAMINATION**

**NURUL ASYIKIN BINTI ZOHARI**

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## **ABSTRACT**

The aim of this study is to discover an innovative design of contact lens case in order to reduce microbial contamination. Different ideas and concept of the design was proposed. In situ washing at both lens and closure cap without contacting lens or hand was proposed in Design 1 and Design 2, as an idea to reduce microbial presence and to improve lens care system. Introduction of cleaning liquid on the lens positioned in the container through tunnels of turbulence flow was proposed in Design 3 and Design 5. The concept of turbulence flow in association with cleaning action on contact lens has been investigated. Cleaning liquid introduced from vertical direction exhibit better cleaning action on the lens in comparison to horizontal, as demonstrated in a simulated case. Among the designs that have been proposed, Design 5 proved the best after modification of the tunnel on closure cap in order to reduce contamination by cleaning action of turbulence flow.

Keywords: contact lens; case; turbulence; tunnel; design

# CHAPTER 1

## INTRODUCTION

### **1.1 Background of study**

Vision disorder consists of myopia, hyperopia and astigmatism. Patients experiencing vision disorders are unable to focus on an object since there is some problem focusing the light on the retina. Vision disorder is also known as refraction abnormalities. It can be corrected using eye glasses, surgical procedures or contact lenses.

### **1.2 Significance and objective**

Contact lenses are preferred among patients especially in young people and athletes due to its convenience and cosmetic outlook. However, complications such as conjunctival hyperaemia and corneal edema occur since some of the users fail to adhere to signs in handling contact lenses (Chiambaretta & Milazzo, 2011). This may be due to the lack of standardized set of instruction for the lens case care. As a result, the users may experience eye pain or visual disturbances.

There are strict criteria of contact lens production that manufacturers should follow. The most important is, not introducing microbial load. Therefore, to reduce the risks