



**9th INDES 2020**  
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Cawangan Perak

PROGRAM  
PROCEEDINGS  
ABSTRACTS BOOK

The 9th International Innovation, Invention  
& Design Competition  
INDES2020

17th May – 10th October 2020

## COPYRIGHT PAGE

Published by: Department of Research, Industrial Linkages, Community & Alumni  
Networking (PJIM&A)  
Universiti Teknologi MARA, Perak Branch  
Bandar Seri Iskandar, 32610, Seri Iskandar  
Perak Darul Ridzuan, Malaysia

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# "EZ-CRUTCHES" AN INNOVATION OF AXILLARY CRUTCHES FOR ORTHOPEDIC CLIENT

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## ABSTRACT

Successful management of clients with orthopedic conditions is a critical process that can be compromised by several factors such as late ambulation and rehabilitation. Though the difficulties and complexities of recovery process management are relatively well known and established for any types of fractures, the use of axillary crutches is the most common and convenient as an assistive device. These crutches help the client in early ambulation to support the weak, injured, fractured, or post-operated leg. This project aims to innovate current axillary crutches into the most client-friendly, called Ez-Crutches to enhance the handling of the standard axillary crutches without hustle. An **elastic Velcro strap** is applied to the standard crutches to secure it whenever the clients lift their hands. Thus, this innovation could prevent the crutches from fall, which leads to difficulty for the clients to pick it up that may cause further injuries. Therefore, this innovative project will be offering a new potential device that enhance the therapeutic intervention in the orthopedic field. This project's extension would be proposed to the Malaysian Orthopedic Association for an endorsement of this Ez-Crutches usage.

**Keywords:** crutches, assistive devices, orthopedic, fractures, fall

## 1. INTRODUCTION

Successful management of clients with orthopedic conditions is a critical process that can be compromised by several factors such as late ambulation and rehabilitation. Though the difficulties and complexities of recovery process management are relatively well known and established for any types of fractures, the use of axillary crutches is the most common and convenient as an assistive device. Crutches are medical instruments intended to help with ambulation by moving body weight to the chest and arms from the legs [1]. These crutches help the client in early ambulation to support the weak, injured, fractured, or post-operated leg. The objectives of this project are to innovate the standard axillary crutches into the most client-friendly assistive device and to introduce the usage of Ez-Crutches to public. The Ez-Crutches are the combination of standard crutch with an elastic Velcro strap to enhance the handling of the standard axillary crutches without hustle.

## 2. MATERIAL AND METHOD

The novelty of this prototype; an elastic Velcro strap which is designed with 80 cm length x 2.5 cm width, adjustable according to the client's shoulder circumference size as it is sewed with a durable elastic band as shown in Figure 1. This elastic Velcro strap is attached to the axillary crutch pad.

The user needs to put the strap on, and this unique design can hold the crutch in place when the user lifts hands. Without it, the crutches would drop, making it difficult for the user to pick it up and cause further injury.



**Figure 1.** Elastic Velcro Strap Attached to Axillary Crutch Pad

### 3. FINDINGS AND ARGUMENT

To testify the feasibility and usage of the Ez-Crutches, a market survey was conducted among 5 clients with orthopedic related problems, and 5 registered nurses. They were given a set of standard axillary crutches and let them try to use them and right after that, the Ez-Crutches were introduced. Then they were asked to answer questions regarding this innovation via a google form. About 70% of them given *very positive reactions* to the prototype. Eighty per cent of participant rated that this is *something needed* and 100% said that this is a *high quality* of the prototype. This innovation focuses on facilitating orthopedics clients with the simple, feasible, and affordable prototype. Contrary with previous product innovation which aimed to correct common issues associated with the use of the axillary (underarm) crutch such as pinched nerves, poor posture, and exhaustion with the use [2]. Other study proposed an alternative design for an enhanced crutch shoe, designed to increase the versatility of the crutch while keeping it affordable and compatible with existing crutch frames [3]. Extensive search found out a limited study related to crutches found in Malaysia, thus, the Ez-Crutches provide a different view of innovation in enhancing client management care. Therefore, to protect the copyright of this innovation, Intellectual Property Right (IPR) has been applied from iRMIs on 30 Sept 2020 with IP code CR002017.

### 4. CONCLUSION AND SUGGESTION

Therefore, the Ez-Crutches will be offering a new potential device that enhances the therapeutic intervention in the orthopedic field. This project's extension would be proposed to the Malaysian Orthopedic Association for an endorsement of the Ez-Crutches usage and crutches' manufacturer in Malaysia such as GNT MediXcel Sdn Bhd for business collaboration.

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Surat kami : 700-KPK (PRP.UP.1/20/1)  
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Sekian, terima kasih.

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