

An Innovative Design of a CPR Device for Sudden Heart Failures

Dhinakar¹, Rishi kesavan² and B. Pradeep³

Faculty of Health and Life Sciences, INTI International University, Persiaran Perdana BBN, Bandar Baru Nilai, 71800 Nilai, Negeri Sembilan, Malaysia.

¹Faculty of Engineering & Computer Technology, AIMST University, Bedong 08100, Semeling, Kedah, Malaysia.

²Faculty of Allied Health Profession, AIMST University, Bedong 08100, Semeling, Kedah, Malaysia.

³Faculty of Allied Health Profession, KPJ Healthcare University College, Nilai, Negeri Sembilan, Malaysia.

Corresponding author email: dhinakarpalani@yahoo.co.in

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UNIVERSITI TUNKU ABDUL RAHMAN, BANDAR BARAT, 31900 KAMPAR, PERAK, MALAYSIA.

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ABSTRACT

Cardio Pulmonary Resuscitation or CPR, is an emergency procedure in which a person presses up and down on the casualty's chest (chest compressions) and give them a series of rescue breathing to help save their life when they are under cardiac arrest. CPR can be done both manually using hands as well as mechanical CPR using a device. The reported incidence of injuries through cardiopulmonary resuscitation using manual chest compressions (manual CPR) is 75.9% and 91.4% in the mechanical CPR type using device. Rib fractures are more common in both the systems. Wrist pain in rescuers performing chest compressions as part of cardiopulmonary resuscitation also has been reported. The rescuers' wrists during the performance of chest compressions significantly strain the scapholunate ligament. To overcome all these problems, we aim at designing and modeling of a novel CPR device. Through simulation techniques, we will arrive at the best design values for all the circuit components. The circuitry for mechanical CPR is broadly divided into mechanical part and electronic part. The electronic part is further subdivided into control part and monitoring part. The circuitry has to be developed and the servomotor will be connected to the circuitry. The servomotor is supposed to give the piston movements with suitable lycra material as a covering material for the piston. This material not only gives softening to the patients but also have lot of medical advantages. With proper designing values, a perfect model of a CPR device can be developed probably with better cushioning effects and a compact finish will be achieved. The developed model will be tested for its performance and will be analysed with all parameters.