

Putri Ni'matul Lillah, 2012, Design of Microcontroller-Based Electrical Stimulator as Substitute of Reflex Hammer. THESIS. Under guidance of Dr. Retna Apsari, M.Si and Drs. Tri Anggono Prijo, Physics Department, Faculty of Science and Technology, Airlangga University.

ABSTRACT

Strain reflex is usually tested by using a hammer tapped to the tendon to yield reflex, then the reflex response strength is classified to a particular scale. According to the practitioners, reflex test nowadays still has some drawbacks because still uses quantitative method to evaluate reflex and diagnose patients. Because of a research has been conducted entitled "Design of Microcontroller-Based Electrical Stimulator as Substitute of Reflex Hammer". It aimed to design and conduct an electrical stimulator that could be used to substitute reflex hammer as well as to get the quantitative value of the strain reflex voltage threshold level of patella. In this study, the tool operating system was programmed with a reflex stimulation voltage level that was given to the patients from level of 1 to level 8. Electrical stimulator has been created and is able to work with the pulse width of 20 μ s, the frequency of 8.488 Hz, and stimulation voltage (V_p) under the condition in which it was connected to tendon resistance a 70-260 Ω stimulate. This electrical stimulator can be used to substitute reflex hammer with spike *output* waveform. This electrical stimulator has a degree of accuracy with the magnitude of 99,592%, it also has a stability level with the magnitude of 99,533%. The quantitative value of the patella strain reflex stimulation voltage (V_p) of arefleksia patient was found 260V, whereas those of normal patients were 200V until 240V.

Keywords: electrical stimulator, stimulation voltage, frequency,