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**Title:** Effects of electrical muscle stimulation early in the quadriceps and tibialis anterior muscle of critically ill patients

Mrs. Marco 23070 Junior craisse@hotmail.com<sup>1</sup>, Mrs. Emilia 23149 Costa eccosta@hotmail.com<sup>3</sup>, Ms. Leticia 23071 Falavigna craisse@hotmail.com<sup>5</sup>, Ms. Michele 23072 Silva craisse@hotmail.com<sup>5</sup>, Ms. Amanda 23073 Freitas craisse@hotmail.com<sup>5</sup>, Ms. Priscila 23074 Silva craisse@hotmail.com<sup>5</sup>, Mr. Marçal 23075 Junior marcaljunior@yahoo.com.br MD<sup>5</sup>, Ms. Cecília 23080 Castro craisse@hotmail.com<sup>5</sup>, Prof. Maria 23081 Andrade craisse@hotmail.com<sup>2</sup>, Mr. Marcos 23084 Gallindo craisse@hotmail.com MD<sup>5</sup>, Ms. Luana 23085 Ribeiro craisse@hotmail.com<sup>5</sup>, Mr. Francimar 23086 Ramos francimarferrari@yahoo.com.br<sup>5</sup>, Prof. Silvia 23094 Sarinho silviaws@gmail.com MD<sup>2</sup>, Mrs. Flavio 23087 Andrade fflaviomaciel@yahoo.com.br<sup>4</sup> and Mrs. Eduardo 23088 França edueriko@ig.com.br<sup>4</sup>. <sup>1</sup> School of Physioterapic, University of Pernambuco - UPE, Petrolina, Pernambuco, Brazil, 56.328-903 ; <sup>2</sup> UFPE Department, Federal University of Pernambuco, Recife, Pernambuco, Brazil, 50050-900 ; <sup>3</sup> Nutrition, Federal University of Alagoas, Maceió, Alagoas, Brazil, 57072-970 ; <sup>4</sup> School of Physioterapic, Universidade Católica De Pernambuco-UNICAP, Recife, Pernambuco, Brazil and <sup>5</sup> UCI Department, Hospital Agamenon Magalhães-HAM, Recife, Pernambuco, Brazil .

**Body:** Background: Electrical muscle stimulation (EMS) is applied to critically ill patients in order to improve their muscle strength, thereby preventing hypotrophy and promoting functional recovery. Aims and objectives: To assess the effects of early EMS in the quadriceps and anterior tibialis muscle strength and in the range of movement of the ankle joint in critical patients. Methods: This is a prospective randomized clinical trial comprising 11 patients with a good cardiovascular and respiratory status under mechanical ventilation for up to 48 hours. Before and after EMS the thigh and leg circumference in both lower limbs and the goniometry of tibiotarsal joint were measured. EMS was applied to just one side of the quadriceps and anterior tibialis muscles until the patient reached level 4 of strength on the Oxford scale. Results: Compared with the electrostimulated limb, a different dorsiflexion of the control limb was observed ( $96.2 \pm 24.9$  vs  $119.9 \pm 14.1^\circ$ ;  $p = 0.01$ ). A reduction of the 10 cm over the lateral malleolus perimetry control limb was observed as compared to the electrostimulated one ( $24.7 \pm 3.1$  vs  $26.4 \pm 4.0$  cm,  $p = 0.03$ ). Conclusions: The use of early EMS in the quadriceps and anterior tibialis muscles was not enough to preserve muscle mass, but it can be applied as a preventive tool against the stance flexion of the ankle joint in critical patients.