Simulations of the effect of the cooling elements' temperature on the hypothermia efficiency

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Abstract

This paper presents simulations of controlled hypothermia for the human head in view of improving the hypothermia process. We study the effect of head parameters, such as thickness of each region of the head (scalp, bone, gray matter, and white matter) heat generation rate, and blood perfusion rate, and the Peltier element cooling temperature on the behavior of the overall head cooling through induced controlled hypothermia. Two models are presented: one without heat generation rate and blood perfusion rate and the other - a more advanced model - with both heat generation rate and blood perfusion rate included. The results are described and discussed.

Keywords: stroke, cooling, hypothermia, mathematical models

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