ROLE AND APPLICATIONS OF CIRCULATORY MODELS IN CARDIOVASCULAR PATHOPHYSIOLOGY

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Abstract

Circulatory models are relevant for research, education and testing of prosthetic devices/ components. Independently of its structure that can be numerical, physical or hybrid the models can be used in different areas of cardiovascular pathophysiology. However, the models are often used to reproduce specific circulatory conditions instead of being used as "systemic" tools. That is to say, the models are used to evaluate the global effects of external disturbances such as pathologies, therapies, special environments or surgery on the circulatory system. Aim of this paper is to illustrate a family of circulatory models developed to represent the whole circulatory system in pathophysiological conditions describing some of the possible applications.

Keywords: modelling of the cardiovascular system, ventricular elastance, arterial elastance, heart assist device, mock circulatory system, lumped parameter model