TECHNOLOGY

Methods for prediction of subject-specific hemodynamic response to vasopressors

OVERVIEW

Background
Vasopressors are medications that raise blood pressure in a patient, which helps increase blood flow to peripheral tissues. Vasopressors are commonly used to treat patients who have a body wide reduction in blood circulation. Currently, vasopressors are administered manually by clinicians, who typically adjust dosage iteratively. Previous attempts to automate vasopressor therapy have not been widely adopted, partially because of a wide individual variation in physiological response to vasopressor treatment. Any automated treatment must account for individual responses to treatment and learn individual patient responses to be effective.

Innovative Technology
Researchers at the University of Maryland and Massachusetts General Hospital have developed an automated system for administering vasopressors that requires only minimal learning to fit a patient profile. The system first determines a cardiovascular model to estimate several “cardinal” values of heart rate, systolic and diastolic blood pressure, and mean arterial pressure. The system then estimates a dose response relationship between at least two vasopressor dosages and the cardinal values. Then, the system can determine a hemodynamic response to new dosages of a given vasopressor. The system can accurately predict mean arterial pressure, heart rate, the product of peripheral resistance and arterial compliance, and the ratio of stroke volume index to arterial compliance.

Advantages

· Automates dosages for vasopressors, removing need for clinician guesswork
· Tested across multiple types of subject groups (young/old and normotensive/hypertensive)
· Can be modeled to work with multiple types of vasopressors

Applications
· Treatment of patients requiring multiple or indefinite vasopressor dosings

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Additional Information

INSTITUTION

University of Maryland, College Park

PATENT STATUS

Patent(s) pending

LICENSE STATUS

Available for exclusive or non-exclusive license

CATEGORIES

- Healthcare
- Software + Algorithm
- Surgical devices

EXTERNAL RESOURCES

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