IV Infiltration Detection using Non-Invasive Sensors

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Technology description

Background

IV infiltration is a common problem, where fluid enters surrounding tissue rather than the vein as intended. Infiltration occurs from issues such as solution tissue toxicity, vasoconstrictors, infusion pressure, and mechanically puncturing the lining of the vein. IV infiltration can result in medical emergencies, with the most critical aspect is timely detection. Currently infiltration is primarily detected by witnessing symptoms or by patients alerting medical staff. A detection system is needed when patients cannot notify medical staff of the symptoms, for example when under anesthesia or undergoing surgery. Early infiltration detection would also benefit neonatal and pediatric units, where complications are most severe and timely responses are of great necessity.

Technology

Georgia Tech inventors have developed a system and method for detecting IV infiltration. The non-invasive sensing modalities monitor for two responses that occur during infiltration: stretching of skin around the infiltration site, and the reduction in bioimpedance. In addition, the technology includes an algorithm for detecting the change of the patient’ s physiology and an alert to medical staff. The incorporation of multiple modalities ensures both early detection and accurate identification for quick response time and treatment.

Application area

Anywhere IVs are administered
Hospitals, emergency rooms, surgery centers, doctors’ offices
Greatly impact pediatric and neonatal populations most

Advantages

Faster detection and treatment
Inexpensive option
Sensing modalities are sensitive to infiltration, regardless of administered fluid coloring
Fusion of multiple modalities leads to higher accuracy and fewer false negatives in detection
Detection would make IV caustic drug delivery safer

Institution

Georgia Institute of Technology

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