Medication infusion pumps are the most popular device in almost all areas of a hospital; therefore, it is important to frequently inspect the accuracy of the infusion pump operation to prevent underdose/overdose accidents” Kim et al (2019).

Abstract:

Medication infusion pumps are the most popular device in almost all areas of a hospital; therefore, it is important to frequently inspect the accuracy of the infusion pump operation to prevent underdose/overdose accidents. However, the conventional infusion pump inspection devices are not suitable for quick and convenient on-site inspection by nurses. In this study, a new IR estimation technique for peristaltic infusion pumps that facilitates on-site pre-screening test with shorter inspection time was proposed. A thin membrane potentiometer was attached to a catheter and the actual IR was estimated based on a time interval between two successive line pushes of an identical cam follower using power function estimation. To evaluate the performance of the proposed IR estimation technique, in vitro experiments were performed using 11 infusion pumps (three for Infusion Pump SET 1 (IPSET-1) and eight for Infusion Pump SET 2 (IPSET-2)) with the same model. In experiments, error rate between the actual and the measured values (using conventional inspection device) were 0.04-1.17% range for IPSET-1 and 2.09-4.32% for IPSET-2, and those between the actual and the estimated values (using proposed method) were 0.02-0.62% range for IPSET-1 and 1.31-4.23% for IPSET-2. The proposed technique had almost equivalent performance with a
commercial inspection device, but the time for inspection was reduced to almost one third. We expect that the proposed technique can provide a tool for simple and convenient on-site pre-screening of infusion pumps by nurses to improve patient safety.

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