



TECH OFFER

EXTRAVASATION DETECTION SENSOR PATCH



KEY INFORMATION

TECHNOLOGY CATEGORY:

- Electronics – Sensors & Instrumentation
- Infocomm – Internet of Things
- Healthcare – Tactile Sensing Platform

TECHNOLOGY READINESS LEVEL: TRL 5

COUNTRY: SINGAPORE

ID NUMBER: MT-TSP-001

Patents: Sensor patch and sensing device having the same, Patents WO2016089307A1 (2016), SG10201904959Q (2021), US10512431B2 (2019), and EP3226946A1 (2023).

Know-Hows:

1. Manufacturing Method and Packaging of Low-Cost Sensor Patch with Piezoresistive Carbon Traces, #PAT19-009/SIP-007, 2019.
2. Definition of Threshold and Conditions of Motion Artifact Filtering for Extravasation Detection System, #TD23-00x/MT-00x, 2023.

Publication: Novel Conformal Skin Patch with Embedded Thin-Film Electrodes for Early Detection of Extravasation, MDPI Sensors Journal, Vol.21, No.10:3429, May 14, 2021.

OVERVIEW

Extravasation injury occurs when peripheral intravenous (IV) medication accidentally leaks from the vein, causing the skin to form a bump and damage to the surrounding cells. Children, neonates, and elderly are prone to IV injuries because of their small or fragile veins. Available devices to detect extravasation are expensive, bulky, and not for routine use. The use of vein visualization devices also does not guarantee detection of extravasation injury.

Our conformal sensor patch can be universally applied to all patients requiring IV therapy to rapidly detect and prevent extravasations injuries. The piezoresistive nature of the sensor detects extravasation when the electrode is stretched. The sensor patch comes with a wireless circuit module that improves the signal-to-noise ratio, perform continuous recording, and can be programmed to send alert of extravasation to clinical staff. This facilitates prompt clinical intervention that prevents adverse effect of extravasation.



TECHNOLOGY FEATURES & SPECIFICATIONS

The technology consists of highly sensitive sensor patch that can be integrated with wireless monitoring system. The whole system is applicable for use in a hospital ward setting.

- The sensor patch is ultra-sensitive at **>40% resistance change** at **2ml** infused volume
- The solution **does not discriminate** the **type** or **opacity** properties of IV fluid
- The solution is **independent** of IV infusion rate
- The sensor patch is **disposable**, and the cost is competitively **cheap**
- The wireless monitoring system uses a **reusable external circuit module** which **can transmit data** to tablet reader hub via Bluetooth
- The wireless monitoring system is able to **send push notification** to clinical staff's smartphone

POTENTIAL APPLICATIONS

The applications include but are not limited to:

- Neonates / Paediatric Operating Theatre IV monitoring
- Geriatric IV therapy and monitoring
- Chemotherapy / Radiotherapy / Neuropathy
- Management of unconscious patients under IV therapy
- Sweat and hydration sensing
- Wound healing detection

UNIQUE VALUE PROPOSITION

- The whole system offers a **lower cost alternative** to what is available in the market
- The sensor patch can be **batch manufactured** through screen-printing process
- It can applied to other clinical use cases on **physiological monitoring**
- The sensor electrode design can be **customized** to specific application requirement
- The sensor patch and wireless monitoring system is a **compact and portable solution** for routine use