

**TECH OFFER**

**Medical Simulation Model for Vessel Puncture and Catheterisation**



**KEY INFORMATION**

TECHNOLOGY CATEGORY:

Healthcare - Medical Devices

Healthcare - Telehealth, Medical Software & Imaging

TECHNOLOGY READINESS LEVEL (TRL): **TRL9**

COUNTRY: **THAILAND**

ID NUMBER: **TO175027**

**OVERVIEW**

Medical simulators are currently utilized in medical education across the globe due to their remarkable resemblance to human traits. The requirement to maintain patient safety and accessibility are particularly important in the healthcare sector. As a result, simulation is used more often in general education classes and professional training programs.

This technology is of a training model for vessel puncture and catheterization and can be used as substitute to a soft cadaver. This model can be used in medical education and training for procedures that require the puncture and catheterization of a neck vein and/or a peripheral blood vessel. The technology is beneficial for medical education because it decreases the risk of dangers such as a perforated carotid artery, causing a pulmonary rupture, and a perforated aorta, causing complications from puncture and catheterization, due to lack of experiences and skills of the one performing the procedure. Education on the model will increase confidence, accuracy, and understanding of users, so that they become more skilled before a real practice with a patient, thus preventing complications to occur from vessel puncture.

## TECHNOLOGY FEATURES & SPECIFICATIONS

This training model for vessel puncture and catheterization comprises of a body, a neck coupled to the body, the neck comprising a neck hollow channel and a neck skin piece covering the neck hollow channel. The material composing the skin and vessels has human body features, allowing the use of an ultrasound probe to press the vessels and distinguishability between the neck veins and arteries. Moreover, the inventive model has suitable properties allowing a trainee to insert a guide wire into a vessel in order to train guide wire insertion into a vessel correctly without causing vascular injuries such as the guide wire penetrating out of the vessel, the direction of the guide wire in the vessel being straight and not curved, folded, or bent, whereby the direction of the guide wire in the model is monitorable by ultrasound which makes it possible to clearly see the position and orientation of the guide wire in the vessel.

## POTENTIAL APPLICATIONS

The primary application for this technology is in medical simulation required for medical education and training for venous catheterisation and venepuncture. The model can also be used to educate about head and neck vasculature of the human body.

The design of the model to have physical characteristics and contain material with human body features which enable efficient ultrasound along with vein puncture and catheterization as if performed on a real patient is beneficial for target users such as vascular surgeons, cardiothoracic surgeons, cardiologists, clinical radiologists, and anesthesiologists.

## MARKET TRENDS & OPPORTUNITIES

The global [Medical Simulation Market](#) size is estimated to be US\$ 2.2 Bn in 2023. (Source: Transparency Market Research) The global industry is likely to be valued at US\$ 14.2 Bn by 2033, expanding at a CAGR of 19.1% between 2023 and 2033. The market in Asia Pacific is anticipated to expand at a CAGR of 20.4% over the projected period of 2023-2033. The industry in the region is anticipated to grow at the fastest rate due to the rise in demand for healthcare simulation and related services. Developing economies of India and China are anticipated to account for a large share of the market in Asia Pacific, led by the increase in emphasis on medical studies and research in these countries.

Students demonstrate greater comprehension of various topics when taught in combination with simulation or pre-education. In line with this, army units and other organizations have included simulations in order to improve their training procedures.

## UNIQUE VALUE PROPOSITION

In comparison to existing commercially available models this technology consists of the following unique characteristics such as

1. The material composing the skin and vessels has human body features, allowing the use of an ultrasound probe to press the vessels and distinguishability between the neck veins and arteries.
2. The model allows for monitoring the direction of needle puncture and following the movement of needle and guide wire, particularly to go into the vessels.