

Business

News Letter

excagol medtech

The logo for excagol medtech, featuring the word "excagol" in a blue, stylized font with a red 'x' and "medtech" in a smaller, black, sans-serif font below it.

3 Development of a prototype for a semi-automated venipuncture automate

Necessity of a semi-automated venipuncture device

Complications of venipuncture occur frequently in elderly and sick patients with weaker and difficult-to-locate veins and lead to a delay in treatment. In addition, patients usually have to be punctured several times. As a result of mispunctures, hematomas and nerve damage can occur. In order to increase the precision of venipunctures and thereby reduce complications, excagol medtech is developing a semi-automated system that can localize and puncture peripheral veins.

Development of a prototype as part of a feasibility study of the semi-automated device

As part of a scientific research project, a technical feasibility study for the implementation of a semi-automated venipuncture system will be carried out. For this purpose, a prototype will be developed which will completely map the function of a semi-automated venipuncture device on a medical phantom arm in order to create the basis for the system. The scientific paper focuses on the construction of the preliminary venipuncture device and on verification tests of its system functions on a medical phantom arm with simulated blood vessels.

For the time being, the developed prototype is designed exclusively for use on a medical phantom arm. All age groups of patients and arm diameter are taken into account. An external monitor displays the user interface, which enables the control of the device by the medical staff. By selecting suitable motors, a high precision of venipuncture is to be achieved.

The device is placed above the puncture area with superficial veins, so that contact with the skin surface occurs. With the help of an integrated ultrasound probe, the blood vessels are localized at depths of up to 10 mm and displayed on the associated display. As soon as the device has been aligned along a suitable vein, the venipuncture is performed automatically by confirmation of the user. The prototype allows a puncture angle between 5-30 degrees, which is automatically adjusted depending on the distance of the vein to the skin surface. After a successful puncture, the angle of inclination will be flattened and the cannula will be advanced another 1-2 mm into the blood vessel. Subsequently, the catheter is detached from the cannula with the help of a special mechanism and the motors are returned to their starting position. The venipuncture automate will also enable a quick and uncomplicated insertion of the cannula. The device will allow the use of all standardized sizes for catheters and cannulas. These will be selected and attached by specialist personnel before use.

The current state of development of the venipuncture system already shows the first promising results with regard to the partial functions, most of which have already been successfully tested in an initial examination. For the completion of the prototype and the examination of the overall system, the elaborated partial functions finally must be combined into one unit.