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Novel Means of Detecting Blood Flow Near Skin Surface

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This invention is an improvement over current venous access technologies. Current venous access methods feature some type of imaging technology that is either displayed onto a screen that is remote from the injection site, or projected onto the skin of the injection site. The following invention allows for improved visualization of venous architecture in a low cost, disposable fashion for both the experienced and inexperienced clinical technician. Also, the IV Access Patch is more portable than other existing methods.

SPECIFICATION

The invention consists of a single "IV Access Patch" comprising the following:

An area of thermochromic liquid crystal sheeting (Mylar or other thin-film preparation) receptive to a temperature range of 32-38 degrees Celsius with sensitivity approximately 0.2 degrees Celsius. The sheeting may have numerous uniformly-spaced small holes through which a needle may pass directly to the skin.

The back of the liquid crystal sheeting section is coated with a substance that cools the skin and promotes thermal transfer; i.e., alcohol-based gel.

The edges of the sheeting are contained in some type of fabric that adheres to the skin (an adhesive).

In addition, the system includes a hand-held grip (a "squishy ball") that contains materials such that, when squeezed, initiates a controlled exothermic reaction (i.e., it gets warm).

The patient will present their arm. The clinician will prep the area and apply the IV access patch. Simultaneously, the patient will squeeze the grip. Squeezing the grip will warm the hand and blood flow near the surface of the hand. The thermochromic liquid crystal sheeting will display areas of surface vasculature because these areas will warm faster than the surrounding skin. Once the vasculature is displayed on the sheeting, the

clinician will insert the needle, through the liquid crystal sheeting, into the indicated vasculature.

We have not seen the idea of thin-film thermochromic preparations used as a skin-surface vascular access device. While numerous embodiments exist for indicating a temperature range, this is the first embodiment that actually uses the technology to indicate the anatomy of vasculature. Also, the addition of elements to manipulate temperature on the skin (gel and hand grip) appears to be novel.

The packaging of the different elements (thin-film thermochromic sheeting, adhesive rim, temperature manipulating elements, holes in the sheeting) does not appear to be obvious.

The invention could be used as an aide to various clinicians in locating and accessing veins for various types of injection.

