

## Venipuncture Site Locator (VSL)

In a matter of seconds, the newly developed pen-sized vein detection device marks the skin over “the optimal vein” for blood draw (i.e. *venipuncture*). The optimal vein is defined as a vein, within a user-designated *scanning area*, with the largest diameter, highest blood pressure, and shallowest depth from the surface of the skin.

First, the operator turns on the vein detector to “scanning mode” and defines a “scanning area” by tracing over the area of interest on the skin. During the scanning mode, the instrument determines the optimal vein. The operator must re-scan the area in the “marking mode”. An LED illuminates when the optimal vein is within the device’s field of view, and the user may have the device mark the specific location.

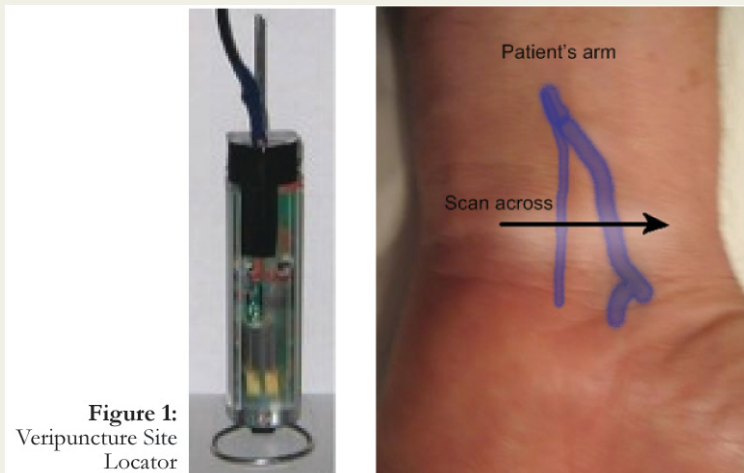


Figure 1:  
Venipuncture Site  
Locator

### The Problem

Though venipuncture is a common routine, difficulties with patients arise frequently due to misjudgments in vein detection. People with certain physical conditions such as obesity, cancer, liver disease, or even patients whose veins have been frequently used, experience this aggravating scenario regularly<sup>1-3</sup>. Even perfectly healthy patients experience similar difficulties, especially in an emergency condition<sup>2</sup>. Studies indicate that 25% of hospitalized patients undergo multiple punctures after the third day of their stay, due to frequent vein usage<sup>4</sup>. The multiple punctures are not only painful, but can also cause bruising, nausea and infection<sup>5</sup>.

### The Need

Hospital Research Associates conducted a U.S. marketing survey which indicated that 63% of 286 respondents who were consulted (phlebotomists, nurses, med-techs and IV infusion nurses) are searching for a practical device to aid them in conducting venipuncture<sup>4</sup>.

### The Alternative

U.S. Patent No. 6,464,646 (Shalom et al.) describes a device for aiding a technician to locate veins within a scanned region. The device is capable of distinguishing the temperature differences between veins and their surrounding tissues. The device employs a scanning mirror and motors for successively imaging the points along the width of the arm, which makes it bulky and costly. It also suffers from a slow imaging rate (i.e. 1-10 Hz) for a single point on the patient’s arm.

### The Benefits of SFU Technology

The pen-sized vein detector is economical, accurate, compact and portable with a fast response. Figure 2 shows the device tested on a volunteer. The wrist was scanned 3 times and a repeatable result was observed. The device can be employed anywhere venipuncture is performed.

### Strategic Opportunity

SFU is looking for the following:

- Industry partners to assist in development of a finished product;
- Prototype development strategy;
- Phlebotomist, nurse, med-tech and/or customer feedback on the utility of the device; and
- Licensing opportunities.

### Contact

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### References

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- <sup>2</sup> American Accreditation HealthCare Commission, “Venipuncture,” (How is the test performed), [online] 2003, <http://health.allrefer.com/health/venipunctureperform.html>
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- <sup>4</sup> PR Newswire Association LLC, “Difficult vein location,” (New Device Solves Problem), [online] 2002, <http://www.prnewswire.com/cgi-bin/stories.pl?ACCT=104&STORY=/www/story/06-26-2002/0001754083&ED.ATE=>
- <sup>5</sup> School of Nursing, University of Virginia, “Adult consent form,” (Risks and benefits), [online] 2005, <http://research.nursing.virginia.edu/ces/RB1.htm>