# Vein Imaging System using Near Infared and DLP

A new noninvasive vein imaging device initially developed for phlebotomy has been tested for the first time for vein treatment. This unique device captures a near infrared vein image, processes it, and projects it onto the skin using green light.

The tricky part is making sure the image of the veins is projected in exactly the right place. Get this wrong, and the system becomes worse than useless. The key is device called a "hot mirror", which is transparent to visible light but reflects infrared (hot) wavelengths.

The video projector and camera are set at 90 degrees to each other facing the mirror, which is set at 45 degrees to both of them. After calibration, this ensures that a vein always appears within 0.06 millimetres of its correct position, Zeman says.

The vein contrast enhancer can detect veins up to 8 mm below the surface of the skin. Green light is used as the backdrop because it is not sensed by the infrared camera.
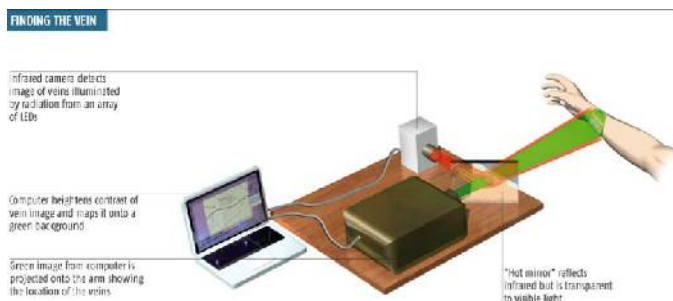
Initially the device was aimed at preventing the discomfort and delay of botched attempts to pierce veins

for injections and blood tests, and to cut the time it takes to set up potentially life-saving intravenous drips.

Currently, the device is being used in several Neonatal Intensive Care Units to reduce stress in premature babies during daily tasks

A pilot study on 23 subjects with varicose veins and telangiectasias was performed. The VeinViewer was tested in five situations:
1. Diagnosing feeder veins with the VeinViewer.
2. Comparison between the VeinViewer and ultrasound.
3. Marking varicose veins with or without the device
4. Phlebectomy using the VeinViewer.
5. Use of laser and sclerotherapy guided by the VeinViewer.

Results

One hundred percent of subjects had feeder veins identified by the VeinViewer. The ultrasound machine detected fewer feeder veins than the VeinViewer.
VeinViewer identified more veins than the naked eye in all subjects. The VeinViewer could help in finding feeder veins during phlebectomy and in guiding laser and sclerotherapy treatments.

Sources:

"Vein imaging: a new method of near infrared imaging, where a processed image is projected onto the skin for the enhancement of vein treatment." Roberto Kasuo Miyake, Herbert David Zeman, Flavio Henrique Duarte, Rodrigo Kikuchi, Eduardo Ramacciotti, Gunnar Lovhoiden, Carlos Vrancken; Dermatologic surgery: 2006 vol. 32 pp. 1031-8; 10.1111/j.1524-47252006.32226.x

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