

# A clearer view

Transillumination has long been used to aid the viewing of superficial veins, but is often ineffective at penetrating thicker body tissue. **TransLite's** Claire Terry explains how the company's side-transillumination method can result in more extensive visualisation at a reduced cost.

## Can you describe how the Veinlite LED works? How does the method of side-transillumination enhance visualisation of the veins?

Veinlite LED uses an innovative side-transillumination method for making skin translucent, so veins can be seen more easily. In side-transillumination, light shines into the skin from outside the area of interest. A circular array of bright LED lights is inclined inwards at an angle, so the light is focused towards the centre of the circle and below the surface of the skin, creating a virtual light source under the skin. This technique achieves uniform transillumination of a small region of tissue and enables visualisation of peripheral veins anywhere on the body.

Veinlite LED uses 24 LED lights in two colours: a bright orange that gives the best differential absorption between venous blood and the surrounding tissue, and a darker red colour, which penetrates dark skin better and goes deeper into the tissue. Together, these two colours give the best results. The deoxyhaemoglobin in venous blood absorbs light, so illuminated veins show up as dark lines. They can easily be identified and their depth assessed. Veins closest to the surface appear darker and more defined than deeper veins.

The 'C'-shaped design provides a wide opening for access with a needle, and by applying gentle downwards pressure on the Veinlite LED while pulling back on the skin, the skin is stretched and the vein is prevented from rolling, making it easier for the needle to penetrate the skin and the vein in a single action.

“ The 'C'-shaped design provides a wide opening for access with a needle, while gentle pressure prevents the vein from rolling. ”

## What are the main applications for the Veinlite LED system?

The Veinlite LED is used in emergency medicine, such as in ambulances and emergency departments, for preoperative IV access, in intensive care, in oncology and chemotherapy, in radiology and research, in endocrinology clinics, and in paediatric or neonatal units. There is also a growing market in home care nursing, as many patients are having infusions administered at home.

The two applications that really inspire us are paediatrics and oncology. No one wants a child to suffer the pain of repeated IV access attempts. Many oncology patients,

especially those treated with chemotherapy, have difficult-to-access superficial veins, but need frequent blood tests as well as infusions, so the Veinlite LED is very helpful for this group of patients.



The deep red light in the Veinlite LED penetrates dark skin more efficiently.

## How easy is it to incorporate the technology into hospitals' everyday practice? And how much effort has been put into making the device user-friendly?

Veinlites are very easy to use and require minimal training. We have provided detailed instructional videos on our web site at [www.translitellc.com](http://www.translitellc.com).

Veinlite LEDs are small and light enough to fit in a pocket, and they have carrying cases with belt clips and space for spare disposable covers. They come with a rechargeable battery and have a low-charge indicator that lights up when the battery has 25% charge left. If the charge has run out, the unit can still be used with the charger plugged into any wall socket and there is a long cord to facilitate this.

## Disposable plastic covers are used to protect the device from contamination. With an increasing focus on infection control, how important is this for your customers?

The disposable plastic barrier covers are vital for preventing cross contamination between patients. As any patient could be infected with an as-yet-undiagnosed infectious disease, it is important to treat every patient as though they were infected, and always use practices that prevent cross contamination. Most hospitals and clinics have strict

procedures that forbid touching a patient with a piece of equipment that has touched another patient. The single-use plastic covers completely encase the Veinlite LED, so the unit does not touch the patient. As an extra precaution, or as required by local procedures, the unit itself can be cleaned with a germicidal wipe, but this should never take the place of using the disposable plastic covers.

**Using the Veinlite LED leads to fewer IV access failures and therefore fewer needle sticks. Can you outline the cost-savings associated with the Veinlite LED?**

There are cost-savings not only from saving staff time and avoiding wasted IV supplies, but also from avoiding the need for the more expensive and invasive surgical procedures required to place a central venous access system. The Veinlite LED pays for itself very quickly when the cost of the surgical implantation procedure and the equipment cost for the catheter or subcutaneous port device are considered.

**Veinlite LED can be used across the spectrum of patients. Which patients is it most useful for?**

Veinlites are most useful when dealing with children, as it's really important to get IV access on the first attempt. They are also really invaluable for dark-skinned, overweight and obese patients, and those who have very difficult-to-access veins for any reason.

Chemotherapy out-patients often lead normal lives most of the time but have to live with a surgically implanted catheter or port, because it's so hard to place a peripheral IV when they come in for treatment.



It's vital to get IV access on the first attempt.

Having an indwelling catheter or port risks infection, and can be a nuisance to the patient; it's also a daily reminder of their condition. Using a Veinlite LED in the chemotherapy out-patient clinic can avoid the need for a central catheter or port. It's a great help to be able to find veins which haven't previously been used for infusions.

**What is Veinlite's success rate?**

Our original fibre optic Veinlite, using the side-transillumination method with the 'C'-shaped design, was tested in a randomised study at Boston Children's Hospital for visualising and accessing veins in the paediatric emergency department. For the study, 240 children with hard-to-find veins were recruited and randomised to the Standard of Care vein access or the Veinlite vein access. Their average age was 1.33 years. After two attempts at accessing the vein, the accuracy for the Standard of Care was 74% while the accuracy for Veinlite vein access was greater, at 85%.

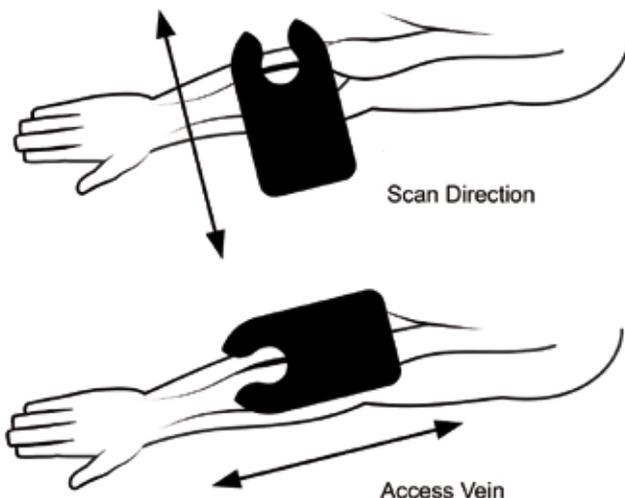
The Standard of Care accuracy is consistent with other published results, which means one out of four children will require a second clinician, more supplies and the additional pain of repeated access attempts. With the Veinlite LED, the IV access failure rate is reduced to one out of 6.7 children.

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**What feedback have you had from hospitals that have used the device?**

We get lots of repeat orders from hospitals. One department may order one or two Veinlite LEDs, then the word spreads and other departments keep borrowing them so then more are ordered. As nurses and physicians move from one hospital to another, they request the Veinlite LED and as a result our sales are growing every year. Things have now progressed to the point where we sell 30 Veinlite LEDs to one hospital and new hospitals planning their equipment purchases budget for, and buy, more than 20 Veinlites LEDs. We also get wonderful spontaneous e-mails from users thanking us for the invention and we even get people asking us if they can sell them to their colleagues. ■

The device is held across the arm to isolate veins, then rotated for access.



**Further information**  
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