

Can the use of infrared vein finder help refine venipuncture?

Noman Mansoor, Aimen Warsi

Madam, Venipuncture is one of the most frequent invasive procedures carried out in hospitals. It involves inserting a needle into a vein in order to extract a blood sample for haematological, biochemical, or bacteriological investigation.¹ Although the most common procedure, it does come with its drawbacks.

A study investigating more than a million venipuncture procedures between 2005 and 2014 revealed that one in every 3700 persons (0.027%) faced post-venipuncture complications.² Although the number is small, it cannot be disregarded. Another study found that mild bruising and hematoma were prevalent, accounting for 12.3% of all venipunctures, with minor bruising being the most frequent. Serious complications were also observed in 3.4% of patients. In 2.6% of cases, there was hypotension and diaphoresis. Syncope occurred in around 1% of patients.³ A study also showed that six patients out of 80,000 seen in a blood-transfusion center over two years had painful peripheral-nerve injuries after venipuncture in the antecubital fossa.⁴ Other possible complications include petechiae, extravasations, oedema, thrombosis, and arterial puncture.⁵ Although the number of post-venipuncture complications is small, it does persist and needs to be addressed. These complications can be reduced to a significant extent by the use of an infrared vein finder.

An infrared vein finder is a medical device that uses infrared light to locate veins beneath the skin. The light passes through the skin and reflects off the blood vessels beneath. An optical sensor then records the reflected light, which produces an image of the veins that can be viewed on a display screen.⁶ When placing IVs or taking blood samples, they aid in greater accuracy and save time because veins can be found quickly and easily. Since needles can be placed into veins more precisely, they can lessen pain and discomfort for patients. They might also lessen the number of issues that can arise when drawing blood or inserting IVs. The near-infrared technology is also useful for finding

the vein for cannulation, therapy, and other medical purposes at a very low cost, for paediatric and elderly patients, as well as others with challenging venous access.⁷ Their use in emergency settings can be vital, as they allow faster vein access hence saving critical time. They can be operated by anyone who has received proper training because they are easy to operate. They are also reasonably priced.

The use of infrared vein finders can greatly help reduce the complications associated with venipunctures and help improve the phlebotomy process. More studies about their uses are required to weigh out the odds that might be associated with them and further improve their uses.

Disclaimer: None.

Conflict of interest: None.

Funding disclosure: None.

DOI: <https://doi.org/10.47391/JPMA.9093>

Submission completion date: 17-01-2023

Acceptance date: 27-05-2023

References

1. Lavery I, Ingram P. Venepuncture: best practice. *Nurs Stand.* 2005; 19:55-65. doi: 10.7748/ns2005.08.19.49.55.c3936.
2. Tsukuda Y, Funakoshi T, Nasuhara Y, Nagano Y, Shimizu C, Iwasaki N. Venipuncture Nerve Injuries in the Upper Extremity from more than 1 Million Procedures. *J Patient Saf.* 2019; 15:299-301. doi: 10.1097/PTS.0000000000000264
3. Galena HJ. Complications occurring from diagnostic venipuncture. *J Fam Pract.* 1992; 34: 582-4.
4. Berry PR, Wallis WE. Venepuncture nerve injuries. *Lancet (London, England).* 1977; 1:1236-7. doi: 10.1016/s0140-6736(77)92442-4.
5. Buowari OY. Complications of venepuncture. *Adv Biosci Biotechnol.* 2013; 4:126-8. doi: 10.4236/abb.2013.41A018.
6. Team U. A Detailed guide about Vein finder in the medical field! Uforya Medical. [Online] [Cited 2022 September 22]. Available from: URL: <https://uforya-medical.com/a-detailed-guide-about-vein-finder-in-the-medical-field/>
7. Al-Saadi SF. Vein Visualization Using Near Infrared (NIR) Vein Finder Technology in Nursing Care: A Review of the Benefits and Shortcomings. [Online] [Cited 2022 March 1]. Available from: URL: https://www.medicaleducation-bulletin.ir/article_141801.html.

3rd Year MBBS Student, Karachi Medical and Dental College, Karachi, Pakistan.

Correspondence: Noman Mansoor. e-mail: nomanmansoor786@gmail.com

ORCID ID. 0000-0001-4095-3343