



GAVePed 2025

Stato dell'arte della visualizzazione delle vene superficiali nel neonato: tecniche di transilluminazione

Alberto Lai



Difficult Venous Access

We can define Difficult Vein Access as a clinical condition in which multiple attempts or special interventions are required to achieve peripheral venous access

CLIN PEDIATR 48: 895-901, 2009



Vascular access in children

It can be stressful for the
child, the family as well as
the care provider.

Naik VM, Mantha SS, Rayani BK. - Indian J Anaesth 2019;63:737-45.



Vascular access in children

It is associated with pain exposure and increased risk of complications, it can postpone the start of surgeries and, in emergency scenarios, may delay life-saving treatment.

VM, Mantha SS, Rayani BK. - Indian J Anaesth 2019;63:737-45.



The size of the problem



Difficult Intravenous Cannulation in Children: Role of Assisting Devices

Nitin Dhochak • Rakesh Lodha - Indian Journal of Pediatrics

The traditional method of locating veins by **sight and touch** is not always effective and any system that can facilitate peripheral cannulation should always be available.





Vascular Access Devices

- ✓ Near-Infrareds Light
- ✓ Ultrasounds
- ✓ Transillumination



Near Infrared Devices

This tool projects infrared light on the skin of a patient and makes veins more visible.



It can display veins up to 10 mm deep but its cost and the low definition of the image do not make it a favourite among many professionals.

Ultrasound-Guided Peripheral IV Placement

Ultrasound is widely used for central line placement and difficult peripheral intravenous access.

Limitations on their use include the high costs of the machine and the required high qualification of the staff.

It presents some limitations in newborns and preterm in whom the peripheral veins are extremely difficult to visualize.



Transillumination

Transillumination uses a high-intensity light source, projected through body structures, to qualitatively evaluate air or fluid collections. Air or fluid produces an increase in the transmission of light.



Use of transillumination technique for venous cannulation in paediatric patients under anaesthesia

May 2010 - Yashwant Singh Payal - Sanjay Agrawal - Jagdish Sharma

Transillumination light source facilitates the visualization of peripheral veins extremities.

This technique can be achieved by using a high power, coloured, cold light LED source.



Transillumination blisters in a neonate

J Am Acad Dermatol 1999;41:264-5

F. Paul Sajben - Neil F. Gibbs - Sheila Fallon Friedlander



A defect in the transilluminator unit, prolonged contact with the skin or failure of the filter to function properly have accounted for the occurrence of these blisters in neonates.

Normal torches can burn the skin and should never be used.

Transillumination blisters in a neonate

J Am Acad Dermatol 1999;41:264-5

F. Paul Sajben - Neil F. Gibbs - Sheila Fallon Friedlander



As reported in various publications it is essential to avoid using hot light sources to prevent burns to patients and **we currently only use cold LED light sources.**

New light to illuminate the world



Isamu Akasaki



Hiroshi Amano



Shuji Nakamura

The Nobel Prize in Physics 2014 was awarded jointly to Isamu Akasaki, Hiroshi Amano and Shuji Nakamura "for the invention of efficient blue light-emitting diodes which has enabled bright and energy-saving white light sources."

Venoscope® II

System for finding vessels that uses **incident light** and tissue translucency, with high intensity LEDs and two light waves



Veinlite® Pediatric

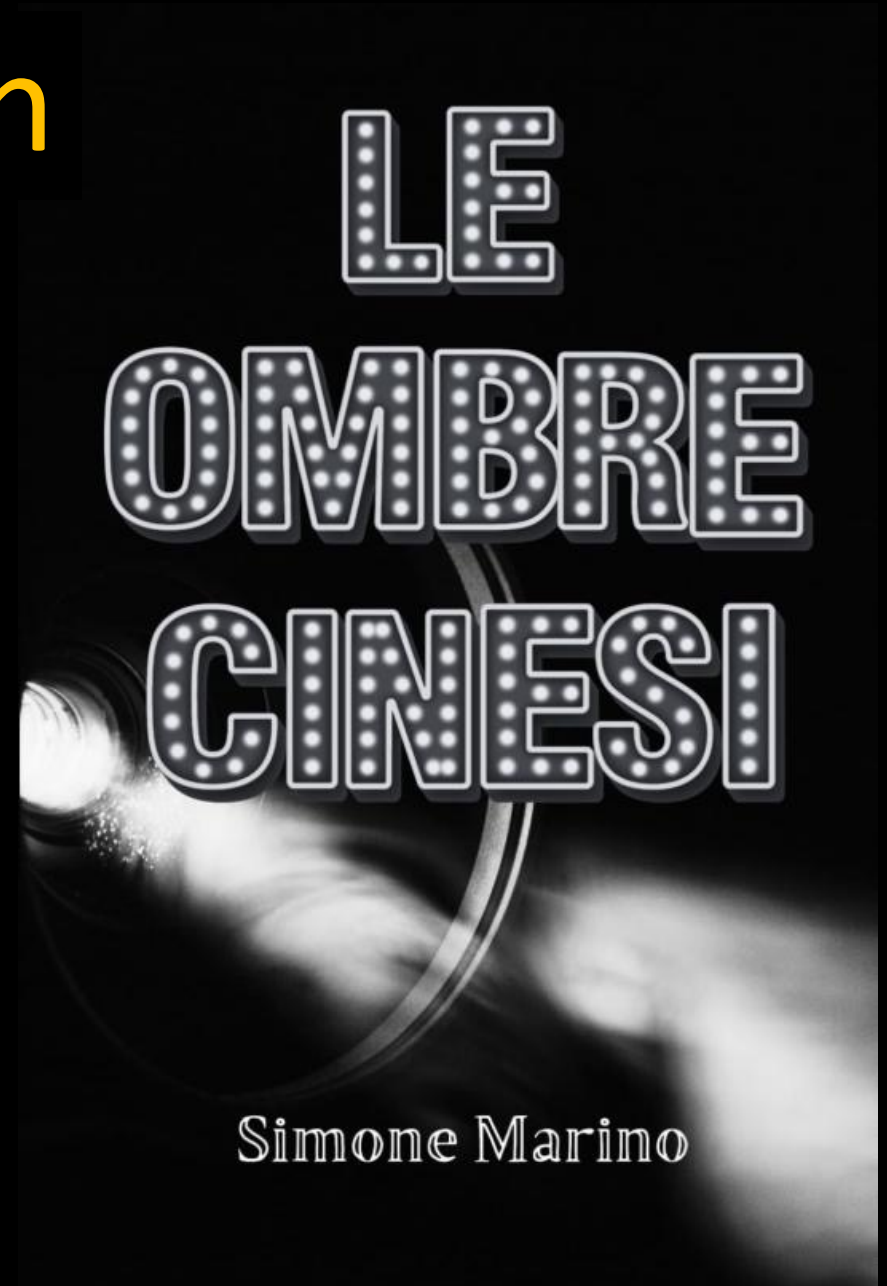


Veinlite EMS PRO®



Transillumination

Transillumination uses a high-intensity light source, **projected through body structures**, to qualitatively evaluate air or fluid collections.



Wee Sight™

Respironics

It's a cheap and pocket-sized Vein Finder but its big handpiece makes it difficult to use with the smaller babies.



Venoscope®

Neonatal Transilluminator

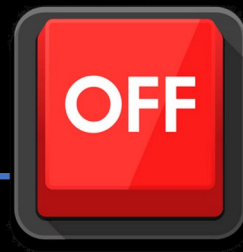
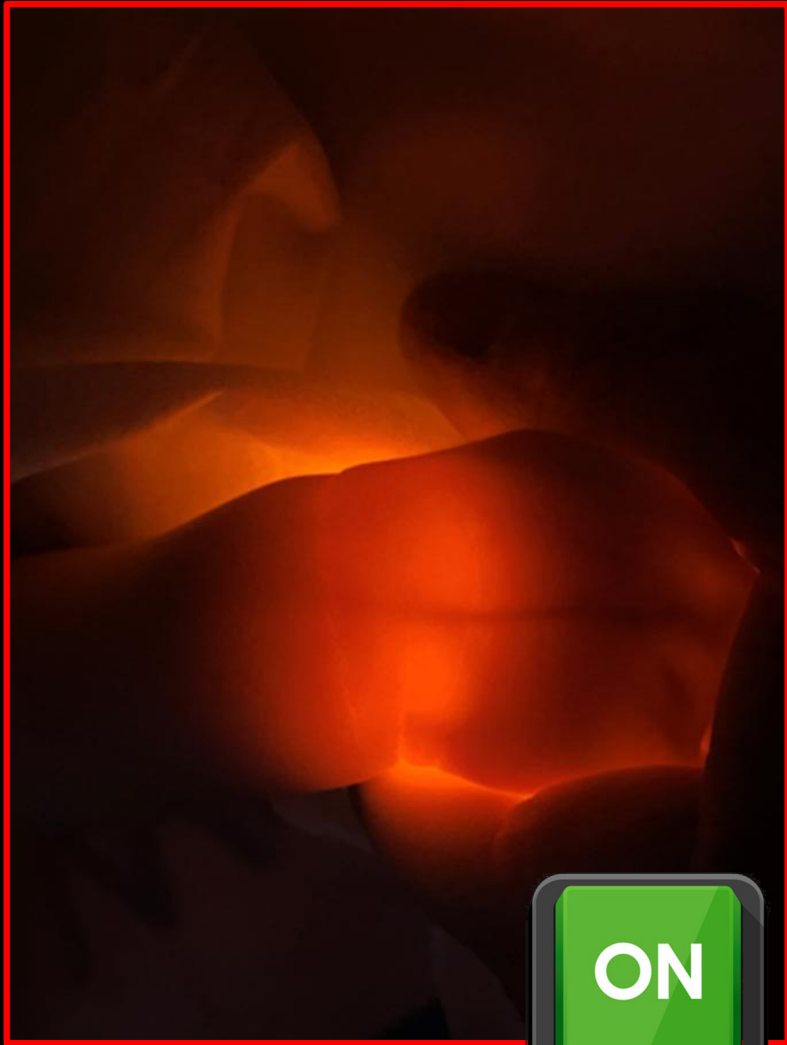
Using a high-intensity, dual colored LED light is better than the previous ones but has the limitation of not being able to adjust the intensity of the light.



SHDT Display Vein Finder Viewer

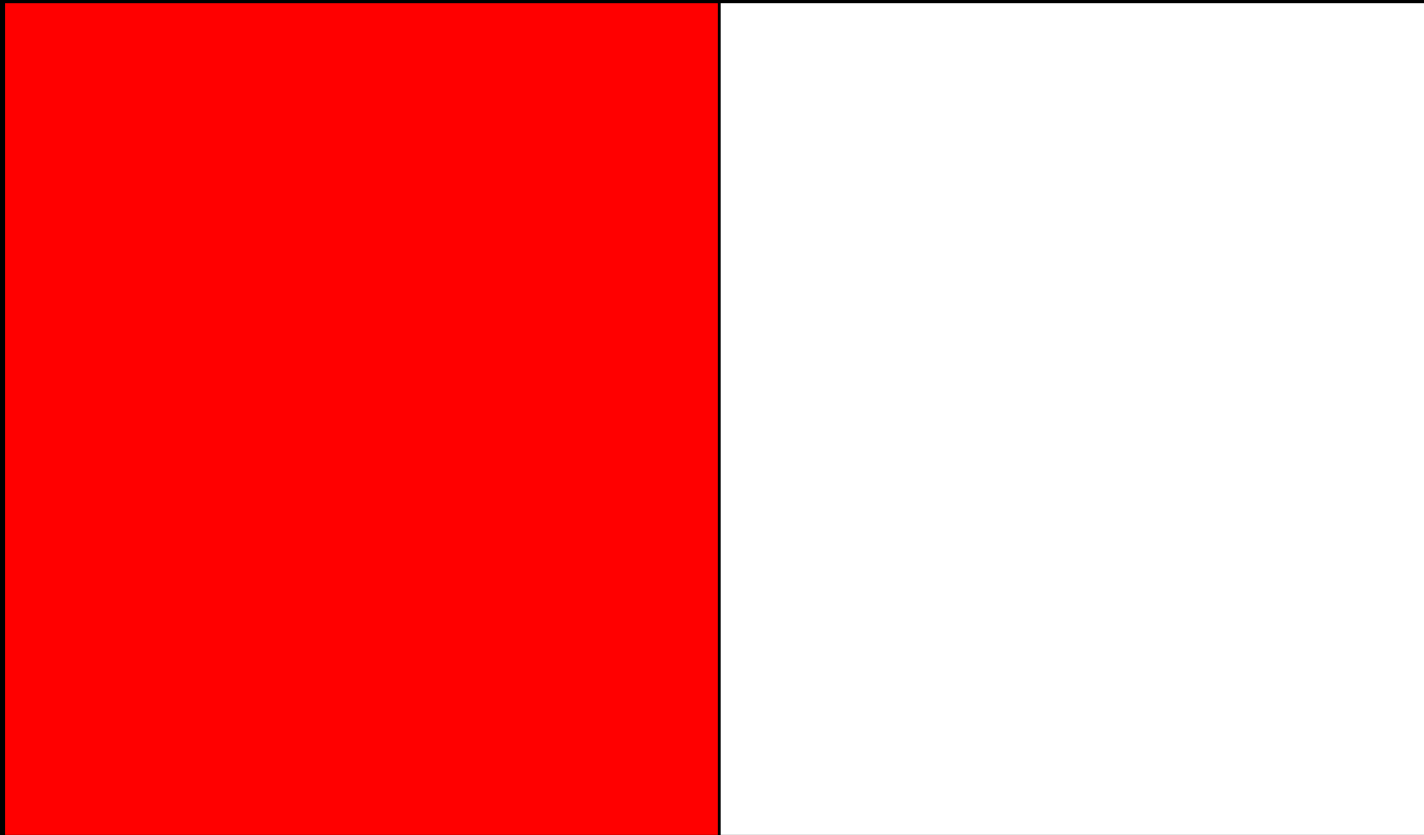


amazon



effect

RED or WHITE EFFECT

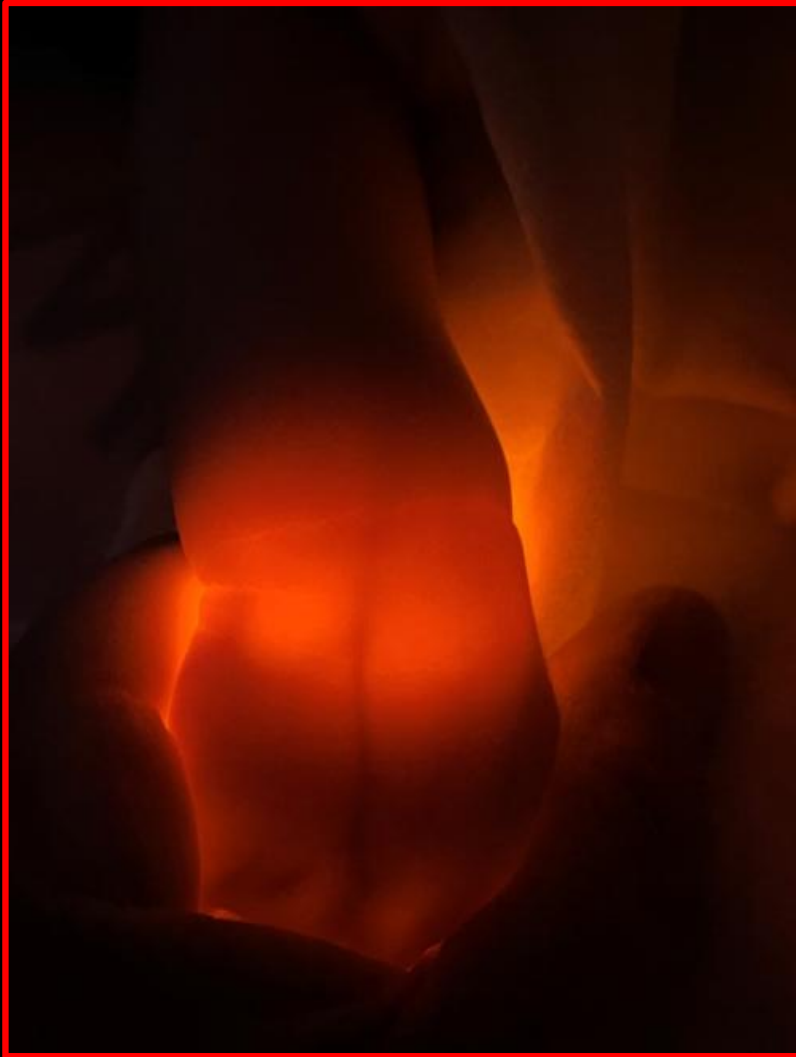


ASTODIA®

Has two high powered LED lights with adjustable brightness. The **orange** light enables sharp contrast, while the **red** light increases the depth of penetration into the tissue.



Red Light

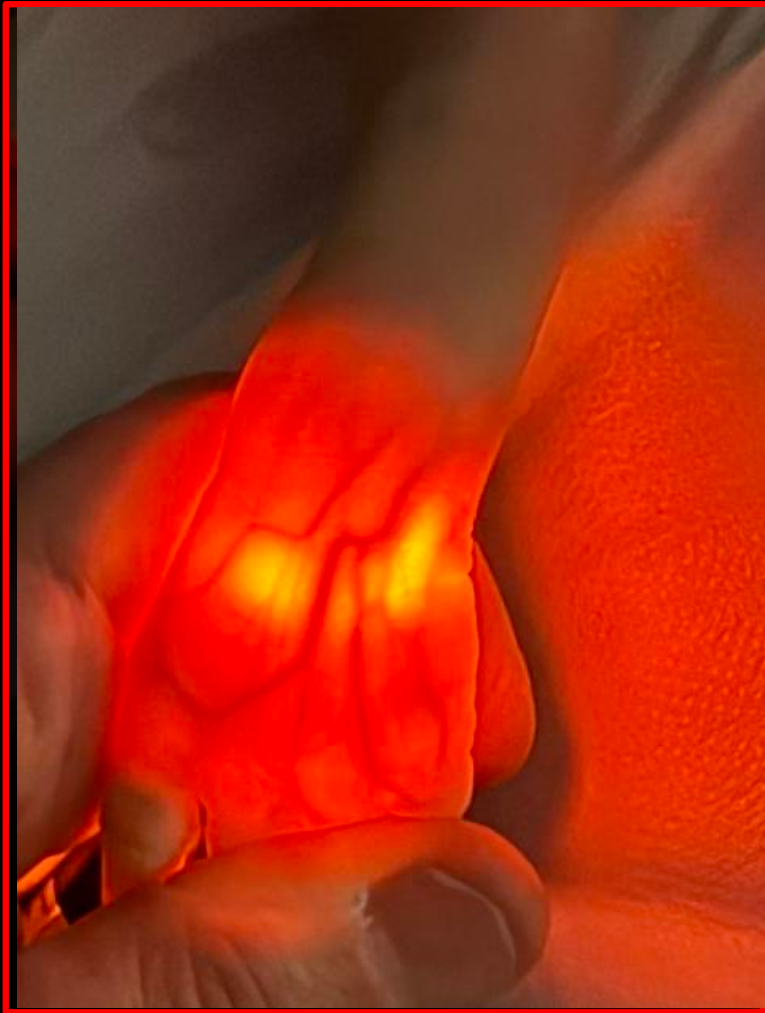


Dorsal venous plexus of the hand
age 2 months

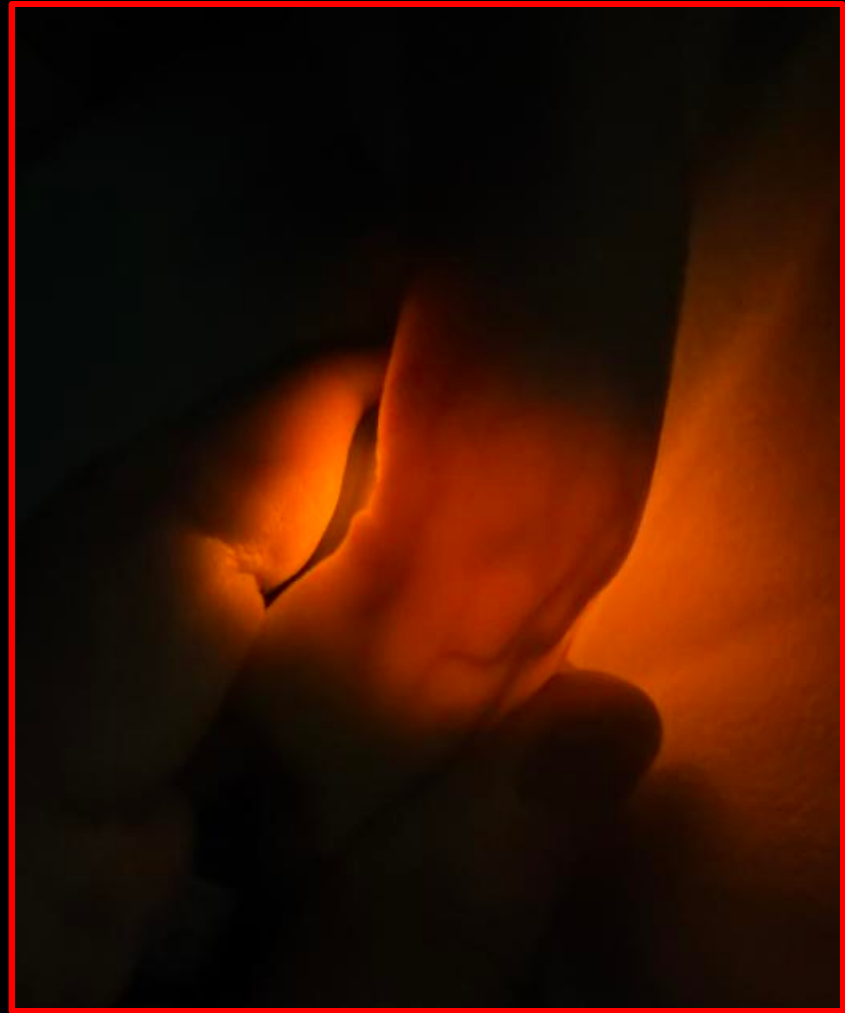


Dorsal venous plexus of the foot
age 1 month

Red Light



Dorsal venous plexus of the
hand - Age 6 months

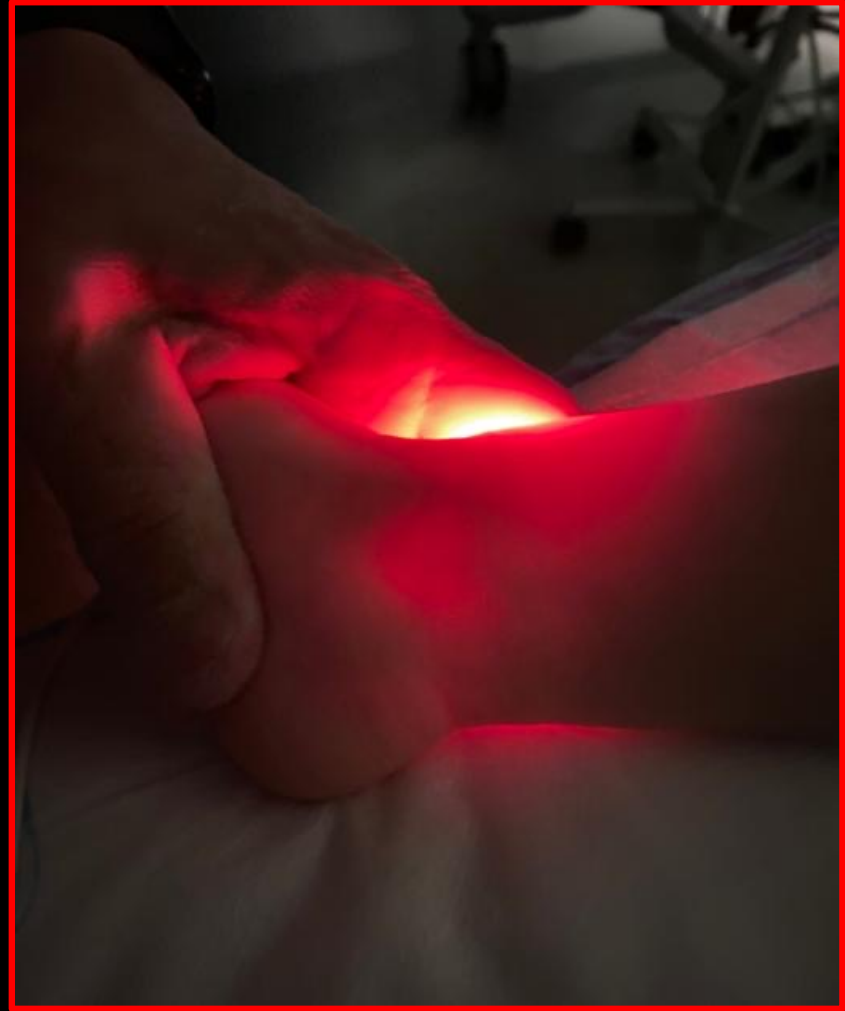


Cephalic Vein
Age 2 years

Red Light



Saphenous Vein
Age 3 months

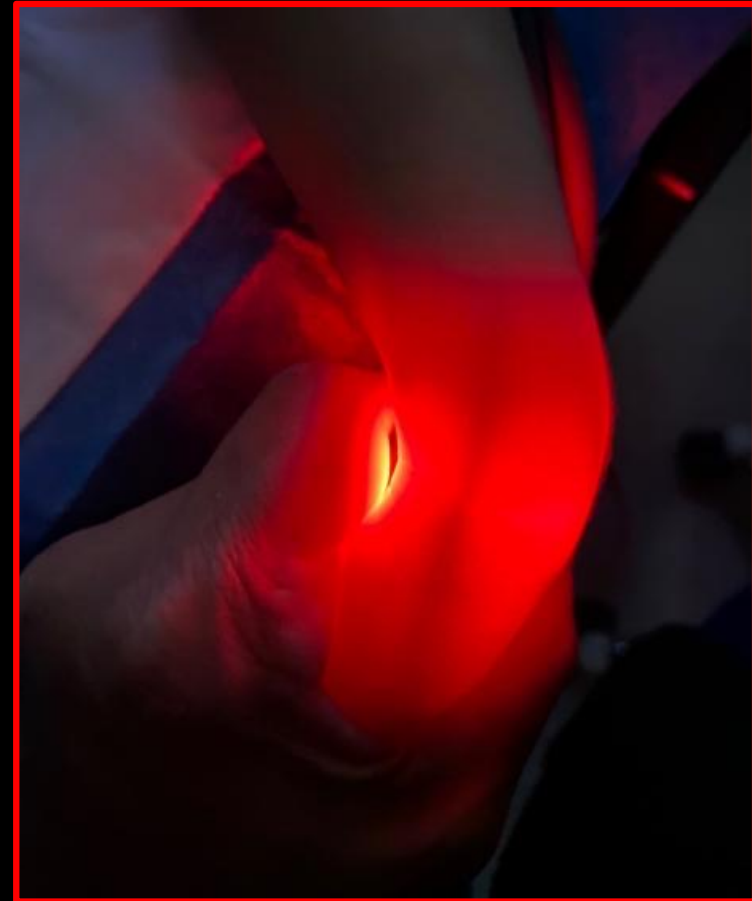


Saphenous Vein
age 2 years

CHUBBY BABIES



Cephalic Vein
Age 18 months



RED LIGHT

Red Light



Dorsal Vein Arch
age 12 months



Cephalic vein at the wrist
age 5 months



Orange Light

Medial Cubital Vein
32 Weeks preterm baby
Age 5 days



Orange Light

Dorsal Venous Arch
27 weeks Gestational Age
Age 1 day



ASTODIA®

The device may be used to identify the radial and ulnar arteries in premature infants or newborns and allows the diagnosis of pneumothorax, pneumoperitoneum and hydrocel.



Rotary donates cutting-edge equipment to neonatal unit

Director of Neonatology Professor Guan Koh said Astodia Diaphanoscope, was the **“FERRARI”** of its kind.



CONCLUSIONS

Auxiliary systems do not shorten the time for easy peripheral venous cannulation, but increase the success rate in difficult venous cannulation.

All centers that deal with children, even sporadically, should be equipped with one or more tools for venous cannulation.

Operators should routinely use these aids to become familiar with them in times of emergency.

Thanks for your attention

