Infant & Newborn IV Training Guide

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Overview

Evan & Adam
RN, BSN
Founders & Creators

FIREFIY
VEIN LIGHT®

Our Mission:

To reduce delays in care in infants and newborns by increasing success rates of 1st attempt IVs on a national scale.

Founders

Firefly Vein Light® was hand designed by two pediatric ER travel nurses that recognized delays in care that were a direct result of insufficient or lack of availability of infant and newborn vein finders. After years of designing, engineering, and testing Adam and Evan are proud to present Firefly Vein Light®.

Acknowledgements

Proudly engineered, manufactured, and headquartered in The United States.

- Engineered: California
- Manufactured (ISO 13485): Michigan
- Distribution/Headquarters: Tennessee

Disclaimer.

- Firefly Vein Light® LLC is not responsible for clinical outcomes of patients while using our products or services.
- This training was designed based on pediatric ER clinical nursing experience.
- Variations to care may apply based on clinical presentation of the patient.
- Always follow your regional, local, and facility protocols.
- Only work within your licensed scope of practice.

What Is A Vein Light (Transilluminator)?

A vein light (transilluminator)

- This is a specialized tool specifically designed to assist in IV placement for infants and newborns.
- Target age <2 years old.
- Vein lights are among the most popular tool used in pediatrics to assist with IV placements.

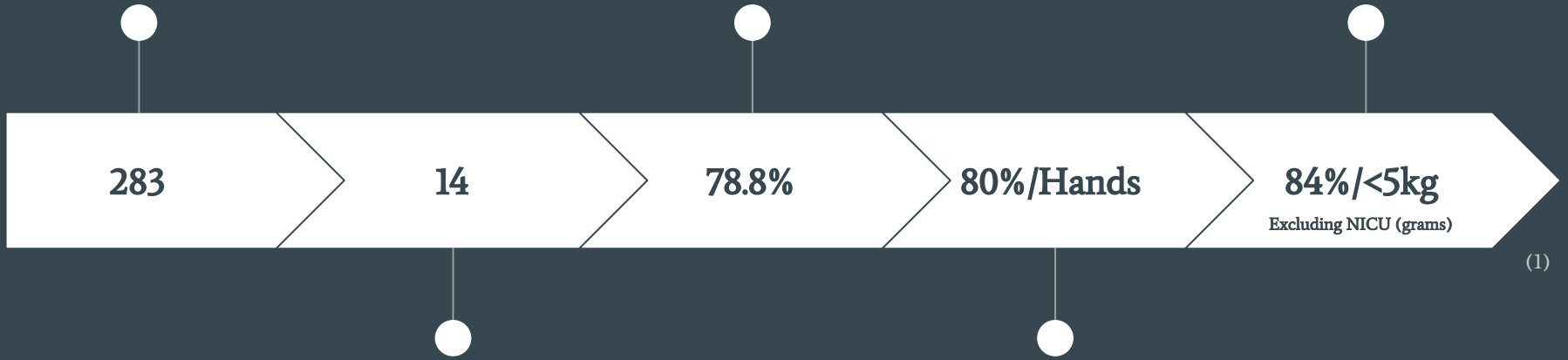
Firefly Vein Light® 2023 Clinical Study

Full report on our website

IV Start Sample Size.

Average 1st attempt success rate using the Firefly Vein Light®.

Highest 1st attempt success rate based on patient weight.



(1)

Total number of states in participation.

Highest 1st attempt success rate based on IV location.

FIREFLY
VEIN LIGHT®

Why <2 years old?

- The first two years the child is still growing into their “baby fat”.
- This poses a unique challenge for nurses as the veins sit below a very thick layer of adipose tissue.
- By illuminating from below you will get an accurate view of the deep veins as well as reducing shadows that can be misleading as seen with other types of technology for IVs in this population.
- As the child grows and develops their motor skills they will develop muscle mass which is much more dense than adipose tissue therefore the transilluminator is specific for this younger age range.

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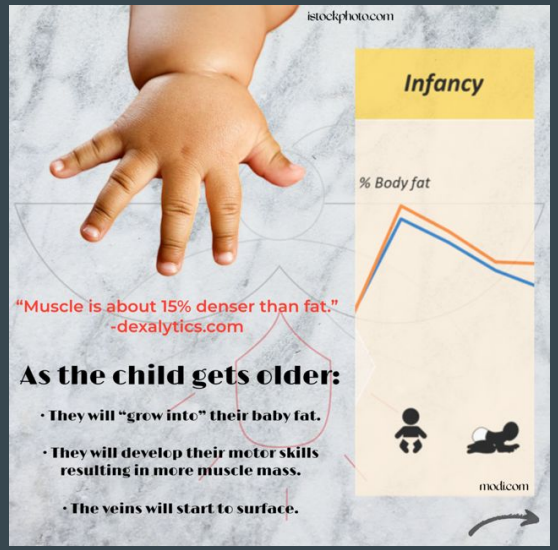

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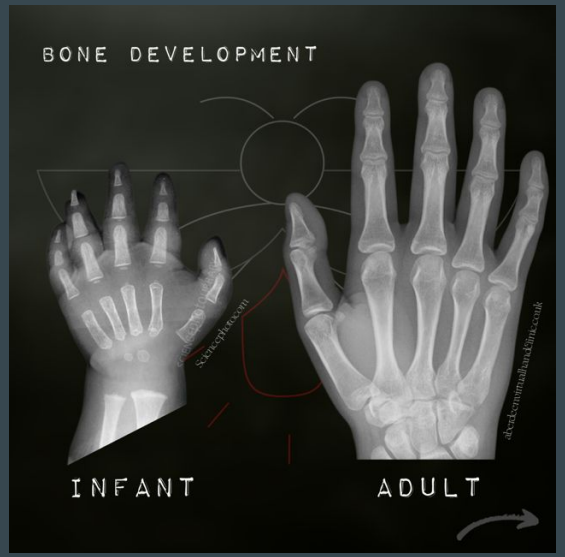

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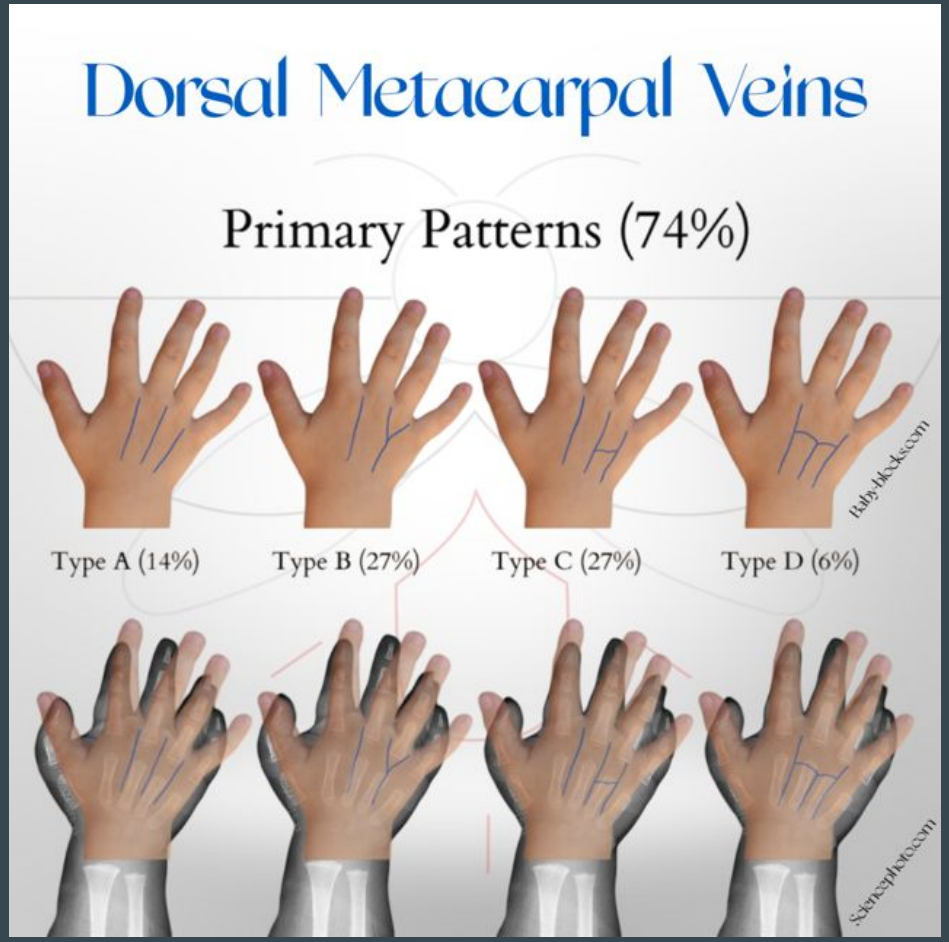
The Hands!


Dorsal Metacarpal Veins
Primary Patterns (74%)
Type A (14%)
Type B (27%)
Type C (27%)
Type D (6%)

(6)

(4)

The Hands!

(1)

^ The top of a 1 year old's hand.

Family Centered Care

The child is not the only patient.

The Family

It is very important be transparent with the plan of care to the family. Placing an IV in their child is a terrifying thought for them. To reduce their anxiety and to boost their confidence in you, briefly explain clinical necessity, the process of the IV placement, and their role in the event. This can be delegated to the charge nurse, child life specialist, or another qualified team member.

Let them be the hero!

Never use the family as your holder. Let them be the hero after the IV placement when they comfort the child.

Give them a role.

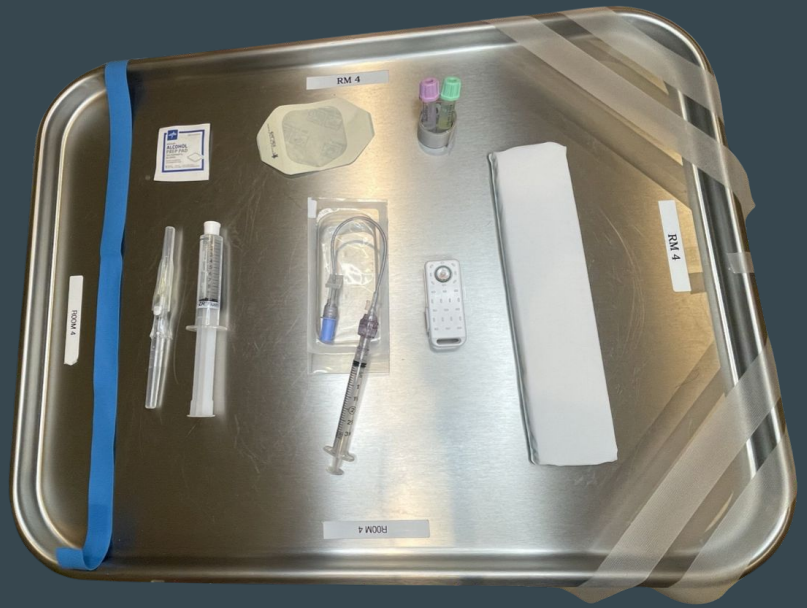
The family loves to be involved. Assign them to turn the lights on once you attain your IV (this will be explained later) or ask them to have the child's favorite toy/blanket on standby. This not only helps them feel like they are a part of the care but creates some distraction for them from the thought of the IV.

The IV Tray

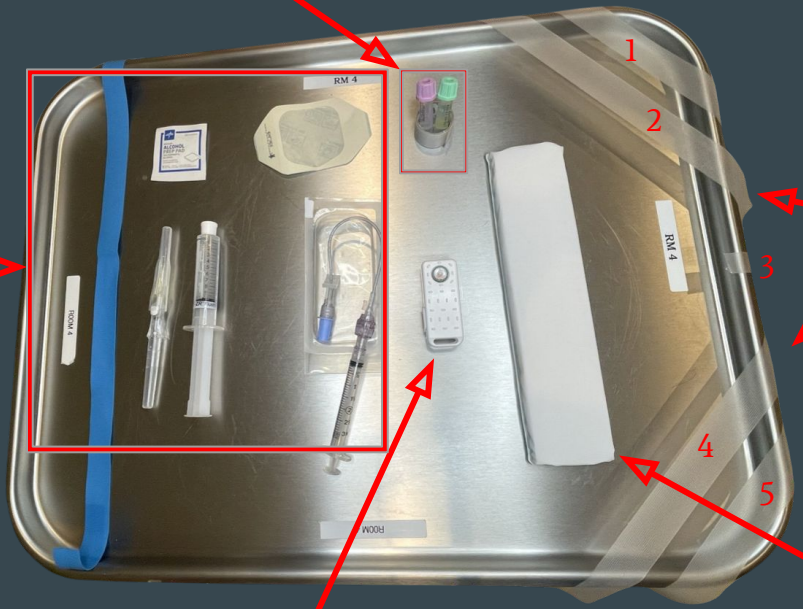
Preparation and Consistency

The IV tray:

- Consistency will be your best friend when you have a fighting child.
- By having your tray set up the same every time you will have quicker response times to the components you need from memory.
- Securing your IV quickly is a necessity with a small child who will fight (and win).



PEDS PRO TIP:
Place peds blood tubes in a roll of tape.



Basic IV set.

Tape for your arm board.

5 total strips.
4 Full.
1 Half (#3)

Arm board. (Sizes vary).

Firefly Vein Light®.

The Firefly Vein Light® Model 2.0*

Hand Designed by PEDS Nurses.

- Clinical application was the highest priority.
- Designed from a PEDS nursing perspective.
- Patient safety was taken into consideration on multiple levels:
  - Safe cleaning
  - Internal thermal sensor
  - Manufactured in the USA with the highest federal standards (ISO 13485).
- By designing the Firefly to attach to your ID badge there is instant access to the tool you need to assist in increasing your 1st attempt IV success.

The Approach

Steps to Success

The approach

- Similar to your IV tray set up your approach should be as consistent as possible.
- Of course there will be variations of approaches based on illness, IV locations, etc.
- We are going to focus on the HANDS which had the highest 1st attempt success rate of IV starts in our 2023 clinical study.
- These techniques will apply (with some variations) for other IV site locations.

Steps to Success

Step 1: Choose your site.

- Once you have the order to place an IV the first step is determining which site you are going to use. (Prior to setting up or getting your supplies).
- Use your Firefly to check all your options

  (anatomy and visibility may vary).

- Recommended IV site for infants and newborns are the hands (80% 1st attempt success rate on our clinical study).

Steps to Success

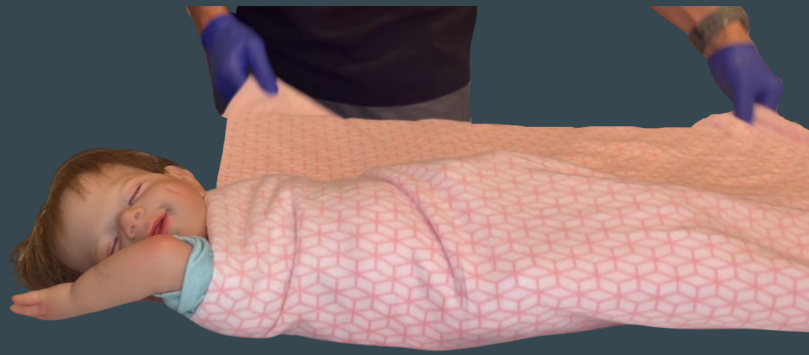
Step 2: Heel Warmer

- Prior to going to get supplies and setting up, place a heel warmer on the desired IV location.
- This will increase blood volume to the desired location.
- Do so with caution for newborns/preemies it may be beneficial to add a layer of gauze between the patient and the heel warmer depending on which brand you use and how intense the heat gets.
- DO NOT USE heat packs. Heel warmers ONLY.
- When in doubt skip this step.

Steps to Success

Step 3: Swaddle

- Possibly the single most important step.
- The swaddle will help reduce the movement of the patient making your IV attempt much easier.
- The swaddle does not have to be tight as that could restrict tidal volume of respirations. A snug yet safe swaddle is key.
- Keep the desired arm (when using the upper extremities) exposed.
- The swaddle should immediately be removed after successful IV/securement when the patient is febrile.



Steps to Success

Step 5: Tourniquet

- Placing the IV just proximal of the IV site can be beneficial.
  - Consider placing the tourniquet on the patient's forearms for IVs in the hands.
  - Consider placing the tourniquet on the upper arm for AC and forearm IVs
- Be mindful of the pressure in the veins when placing a tourniquet too tightly. In most cases you cannot palpate the vein below the adipose tissue.

Steps to Success

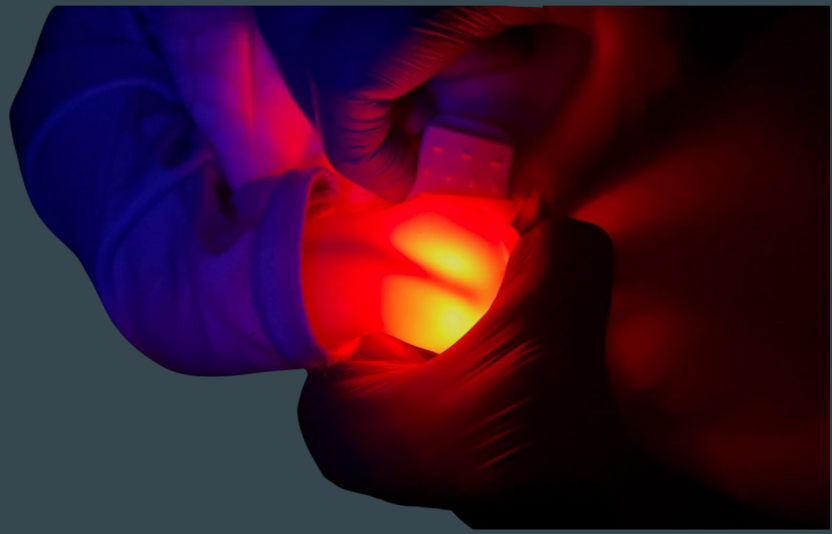
Step 6: Hold

- The 2nd most important step.
- Get another nurse or tech to hold the patients extremity.
- Remember let the parents be the hero after and not the holder. It is ok to have the parents hold the feet as that is more therapeutic than anything.
- It is extremely important to hold the elbow to prevent the patient from bending their arm during the IV placement.
- The holder should hold the tourniquet ends in their hand as well.

Steps to Success

Step 7: Dim the light

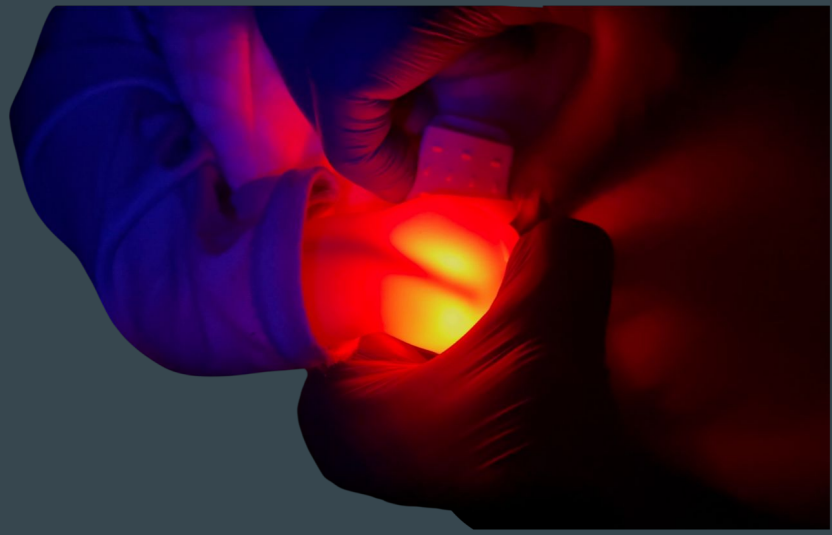
- Dimming the lights can be beneficial to maximizing the technology of using a transilluminator.
- You will still need a light source to see your flash of the IV catheter (computer, overhead dimming lights, partially open curtains, etc).
- This is a good opportunity to give the parents a role in their child's care by having them turn the lights on for you when you are in the vein.



Steps to Success

Step 7 (Continued) : Lumen Settings

- The Firefly has four different lumen settings
  - 7, 14, 22, and 29.
- The lower lumen settings are designed for newborns and NICU patients.
- The higher settings are designed for your heavier patients and darker skinned patients.

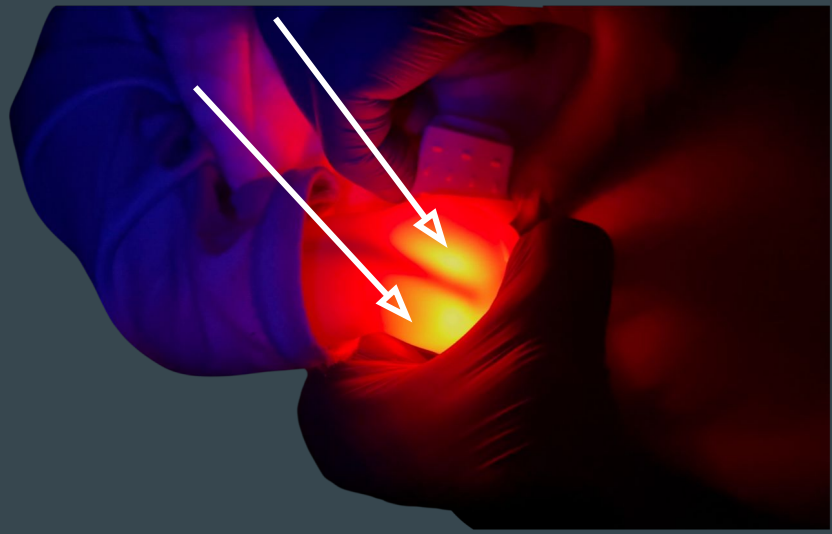


- There is a built in thermal sensor on the Firefly that will deactivate the device if heat is detected to protect the patient's skin.
- The device was designed to prevent generating heat but was added for additional safety.

Steps to Success

PEDS PRO TIP!

- If you press down with your finger on each side of the vein while illuminated the vein should bow around your finger.
- This is a good indicator that the vein has adequate blood volume for you to attain the IV.
- If the vein does not move it is worth considering another location.

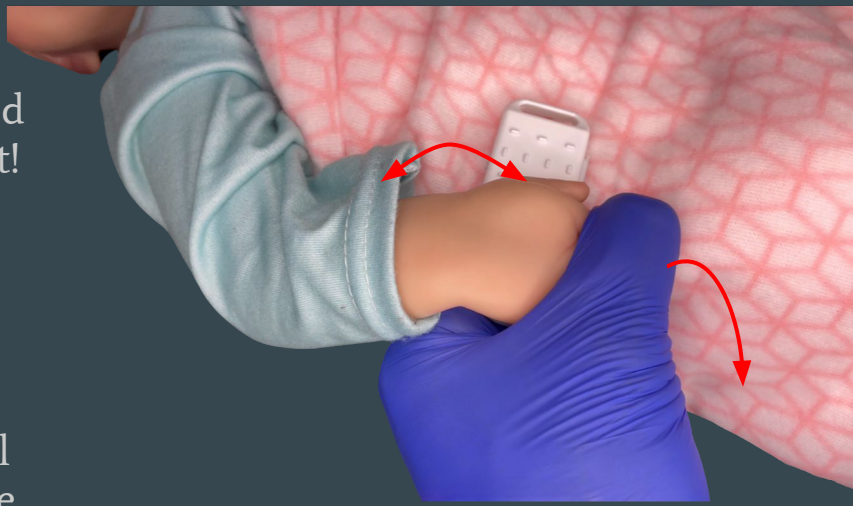


The IV Technique

Steps to Success

The Hand Hold

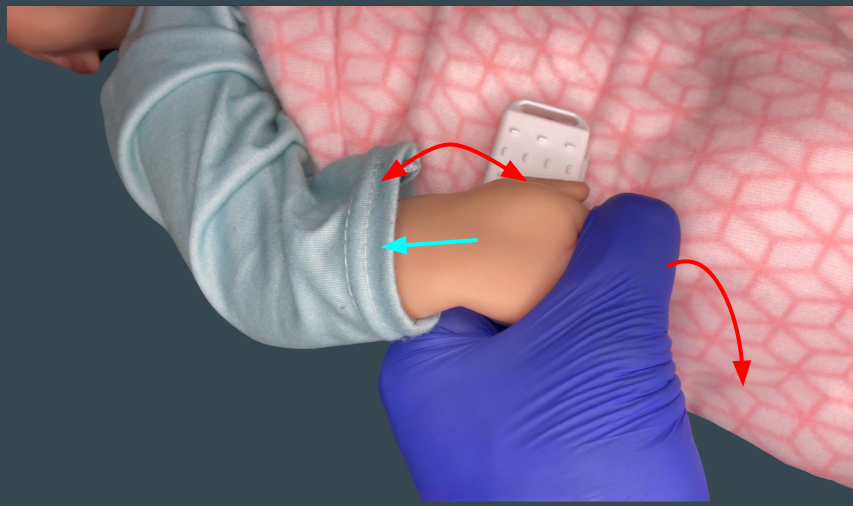
- Place the Firefly FIRMLY against the patient's hand from below.
  - Note the studded surface. This was hand created to help with traction for the diaphoretic patient!
- Curl the patient's fingers around the Firefly and use your thumb in a downward manner to help create tension on the top of the hand.
- Flex the patient's wrist downward while holding.
  - Both of the last two tips are important to help create a tight surface. This will help you control the adipose tissue and make it easier to advance your catheter through the patient's skin and into the vein.
  - This will also help stabilize the vein.



Steps to Success

PEDS PRO TIP!

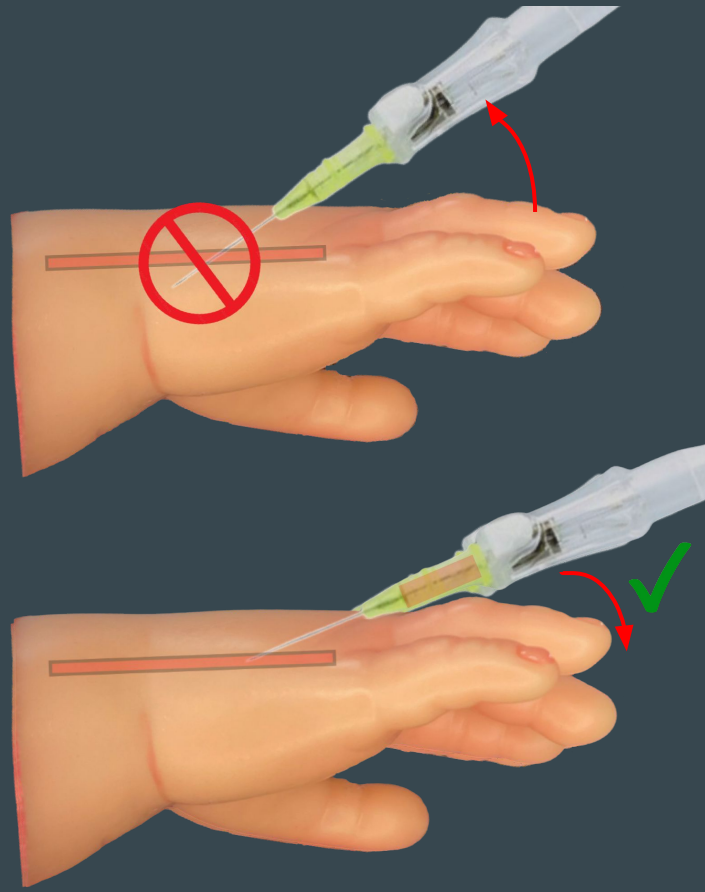
- Have your holder lightly pull back on the patient's skin just above your desired IV site.
- This will create a bit more tension of the skin making it easier for your catheter to advance through the skin.



Steps to Success

Small Target!

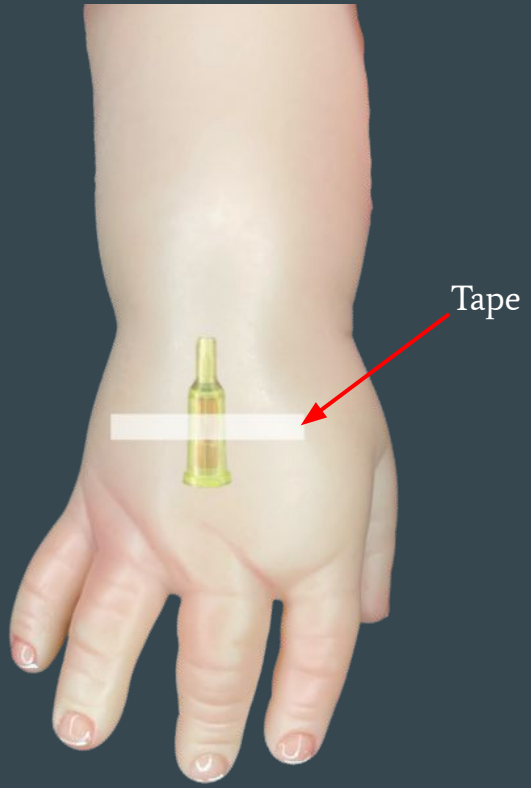
- As you can imagine the infant and newborn veins are very small so your IV should be slow and smooth to prevent going through the backside of the vein with your IV catheter.
    - Maintaining a slightly lower angle than you would with an adult will help prevent this as well.
- 24 gauge catheters are ideal and sufficient for most patients <2 years old.
    - There are short and long lengths that can be beneficial depending on anatomy.
- Once you achieve flash in your catheter lower your angle slightly and advance the catheter.



Steps to Success

Securing the Hub

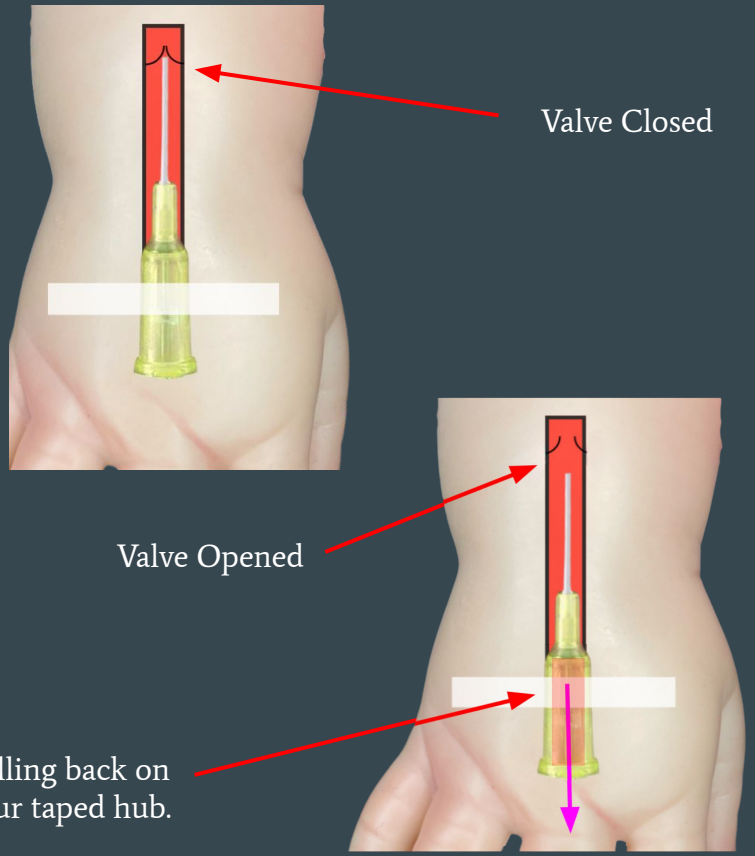
- Once you have attained a successful IV placing a thin strip of tape on the hub will be beneficial for multiple reasons.
  - (Again) The patient will fight…. And win.
  - The tape will prevent you from losing your access while you prepare to secure your line.
  - Infant and newborn anatomy is tiny. This means the valves are likely going to be close to the end of your IV catheter.
    - You can now pull back slightly to assist in your blood draw without losing your line.



Steps to Success

Valves

- The anatomy on infants and newborns tend to be very different due to size. You will often encounter the tip of your catheter sitting right on the valve. You will feel a vibration when drawing blood.
- The thin strip of tape allows you to pull back slightly to assist blood flow resulting in the valves opening and you drawing the blood needed.

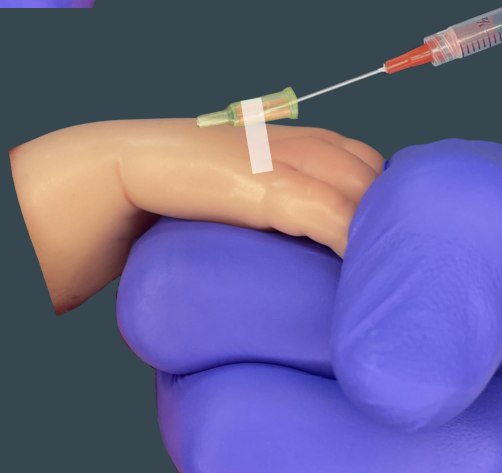


Steps to Success

Blood Draw

- There are two methods to drawing blood from the hub outside of the traditional way of pulling from the line.
  - Drip Method: The peds lab tubes caps come off and there is a lip that is used to catch blood as it drips from the hub.
  - Blunt Tip Method: You can use a blunt tip needle and an empty syringe to pull blood as it comes from the hub (this can be helpful for blood cultures).
- These two methods are beneficial because it allows the blood to flow out naturally without causing stress on the vein from pulling from the line.

Drip Method

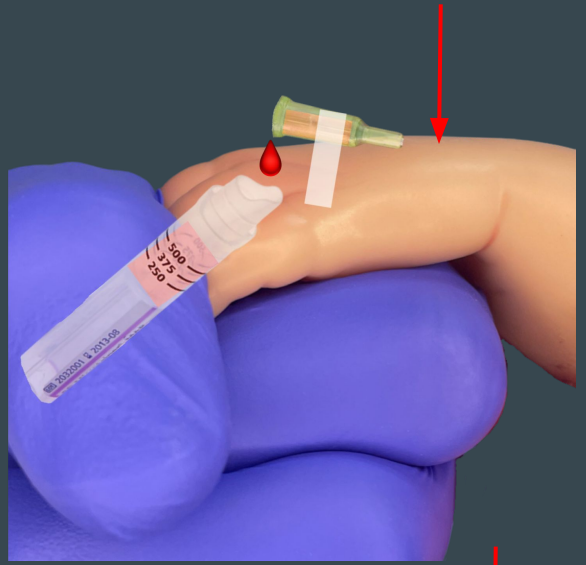


Blunt Tip Method

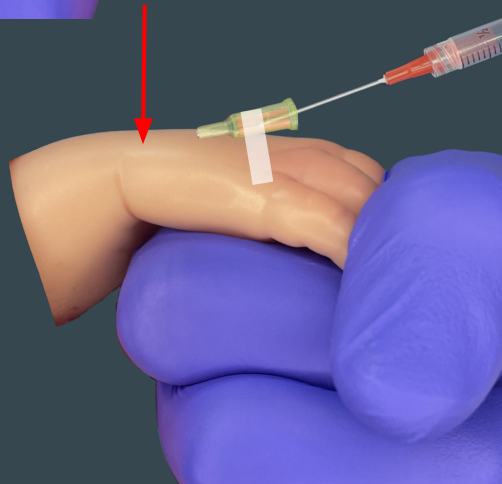
Steps to Success

PEDS PRO TIP!

- Have the holder press on the patient's skin creating pressure to stop the blood flow between tubes and/or syringe changes.



Drip Method



Blunt Tip Method

The Arm Board

Steps to Success

The Arm Board

- Placing tape in “X”s on the patient's forearm and the top of the hand (over the hub) will help secure the arm board to prevent potentially losing your line
- One thin strip of tape should be placed across the finger on the front of the board creating a fist to prevent the board from moving from finger movement (displayed in pink).
- Gause can be used to pad the tape to prevent taping directly to the patient’s skin.
- Follow your hospital’s policies for range of motion requirements when having an arm board on during admissions.

Steps to Success

PEDS PRO TIP!

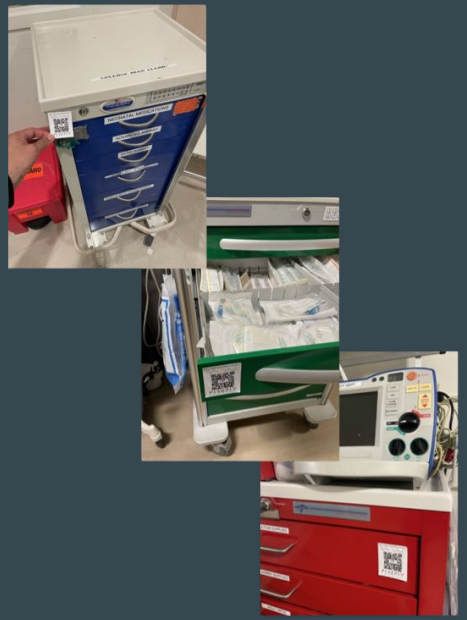
- Placing a diaper over your secured armboard to prevent the child from pulling on it potentially causing a lost line.

Additional Resources

Video/Step by step

QR Code Sticker

- Designed to place on your PEDS crash cart, IV tray, or nursing station.
- Instant access to our step by step video for a quick refresher prior to attempting your infant and newborn IV.
- PDF Training Guide
- QR code also provided on every Firefly badge buddy.



Thank you for allowing Firefly to be a part of the care you provide to the children in your community!

www.fireflyveinlight.com

Chattanooga, TN

References

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(6) www.baby-blocks.com/vascular-access-detail/blind