Clinical Pathways

Peripheral Venous Access

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Connecticut Children's

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Objectives

- Identify important components of the Peripheral Venous Access Clinical Pathway
- Summarize P-L-E-A-S-E
- Discuss behavioral interventions and age specific considerations
- Outline the topical anesthetics available and how they are best used
- Describe the DIVA score and how it is useful
- Demonstrate use of the Peripheral Venous Access Clinical Pathway

What is a Clinical Pathway?

Evidence-based guideline that decreases unnecessary variation and helps promote safe, effective, and consistent patient care.

Why is this Pathway Necessary?

- Venous access is most common source of pain for patients in the hospital
- Currently there is inconsistent analgesic use for peripheral venous access
- Current nursing protocol is interpreted differently by different staff members
- There is often inaccurate or absence of documentation for venous access procedures
- To provide a guideline for a standard approach to venous access procedures
- To improve the patient and family experience

Objectives of Pathway

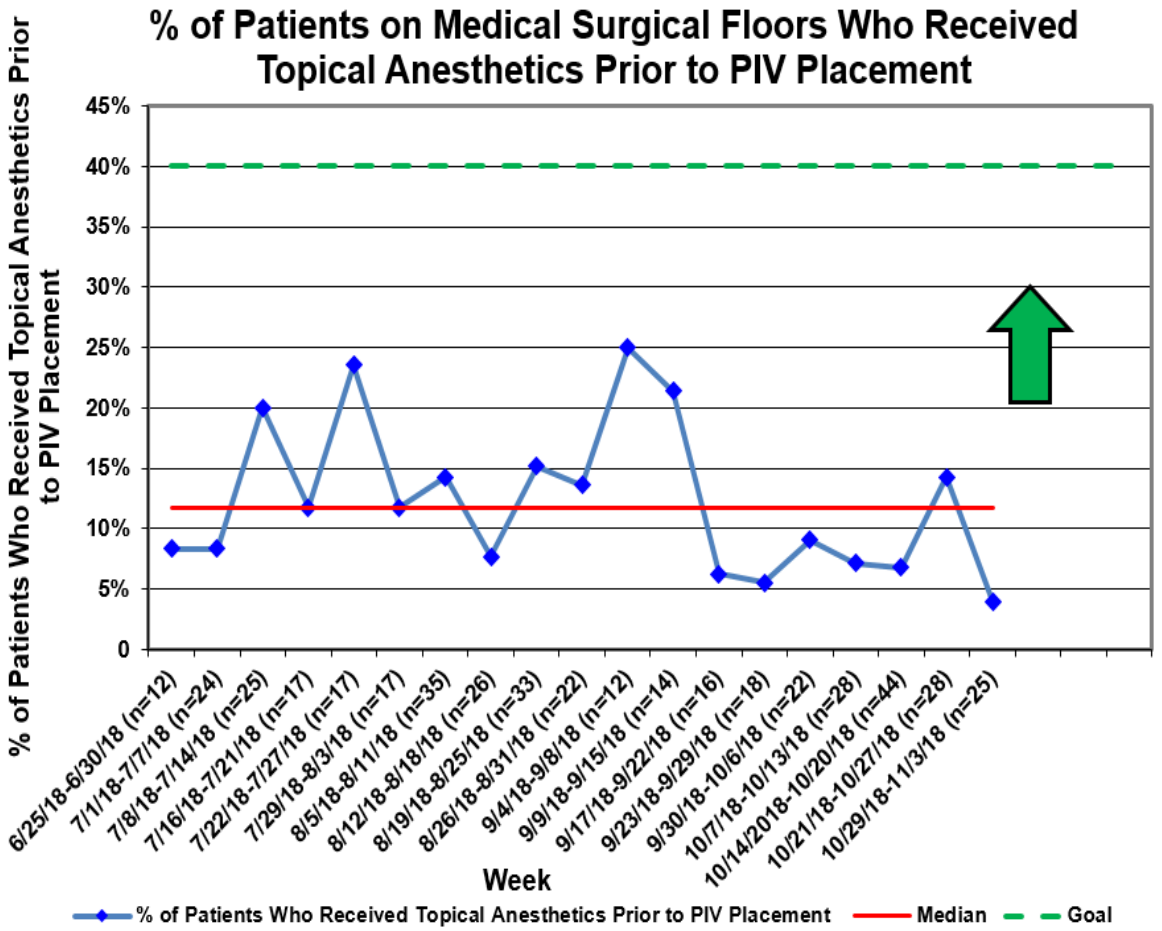
- Standardize and increase use of topical anesthetics for venous access procedures
- Reduce number of venous access attempts
- Identify patients with difficult venous access
- Standardize and increase use of child life /behavioral support techniques for venous access procedures
- Improve documentation of venous access procedures

What is Peripheral Venous Access?

- Accessing vein to obtain blood work and/or infuse medications, hydration fluids, nutrition, blood products
  - Peripheral IV placement
  - Venipuncture
- Most common procedures performed on children in hospital

Pediatric patients rate pain from needle sticks as the "worst pain" they experience in hospital

Connecticut Children's Data



Prior to our interventions, 10% of patients on Medical Surgical Floors were receiving topical anesthetics prior to PIV placement.

Change is possible!

University of Minnesota implemented a hospital-based, system wide initiative, Children's Comfort Promise

- They implemented a new standard of care for needle procedures that includes:
  - topical anesthetics
  - sucrose or breastfeeding for infants 0-12 months
  - comfort positioning (including swaddling, skin to skin, tucking for infants, sitting upright for children)
  - age appropriate distractions
- After implementing this protocol, **overall pain prevalence significantly reduced** at their institution

Postier, et al. Pain Experiences in a US Children's Hospital: A Point Prevalence Survey Undertaken After the Implementation of a System-Wide Protocol to Eliminate of Decrease Pain Caused by Needles. Hospital Pediatrics. 8(9): September 2018.

University of Minnesota's Children's Comfort Promise

Table 3

Percentage of audits indicating best practices were offered by hospital unit, before and after comfort promise implementation.

Department/unit (N units)	Ambulatory phlebotomy (2)		Medical/surgical (4)		Neonatal (4)		Critical care (3)		Ambulatory clinics primary (12)	
Implementation date	January 14, 2014		July 1, 2014		January 1, 2015		May 1, 2015		July 1, 2016	
Data collection points	Baseline (n = 52)	October 2014 (n = 64)	Baseline (n = 38)	December 2016* (n = 40)	Baseline (n = 121)	December 2016 (n = 206)	Baseline (n = 35)	December 2016* (n = 50)	Baseline (n = 202)	December 2016* (n = 19,949)†
Numbing %	0	56‡	0	85	0	98	0	94	0	60
Sucrose or breastfeeding %	0	100	10	83	36	98	25	81	0	90
Comfort positioning %	28	100	39	75	21	99	20	100	62	60
Distraction %	44	95	62	75	28	96	60	100	59	60

Some clinical areas were not included in this table due to low procedural frequency in their patient population (ambulatory specialty clinics, radiology, short stay, perioperative sites, and one overflow med/surg unit), or inconsistent or insufficient audit volumes (EDs).

* These units have not yet reached their target goals and are still collecting audit data.

† Baseline audits were conducted manually. They are now embedded in EMR and pulled 100% monthly.

‡ Note that phlebotomists are not allowed to apply topical anesthesia.

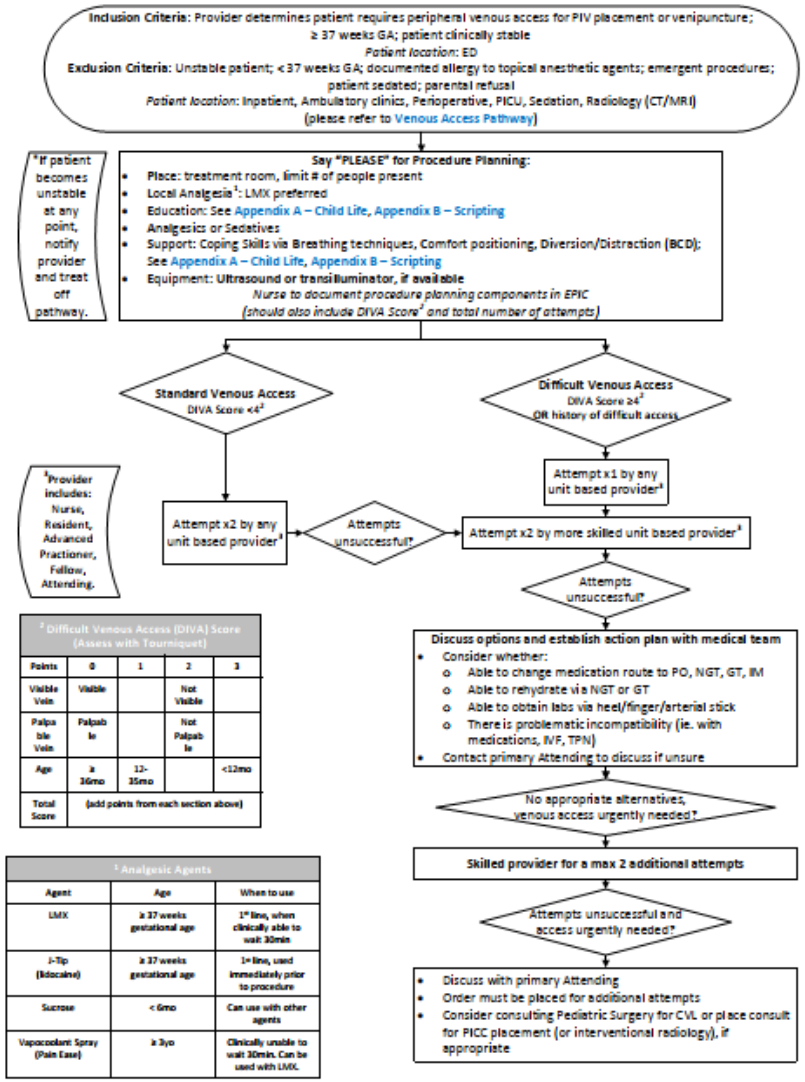
NOTE: By implementing the comfort bundle, the percentage of time topical anesthetics, sucrose/breastfeeding, comfort positioning, and distraction were used increased from baselines as low as 0% to 75-100% of the time in most locations in the hospital.

Friedrichsdorf SJ, Eull D, Weidner C, Postier A. A hospital-wide initiative to eliminate or reduce needle pain in children using lean methodology. Pain Reports. 3 (2018)e671. 1-11.

CLINICAL PATHWAY:

Venous Access – Emergency Room Care

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.



[2] Difficult Venous Access (DIVA) Score (Assess with Tourniquet)

Points	0	1	2	3
Visible Vein	Visible		Not Visible	
Palpable Vein	Palpable		Not Palpable	
Age	≥ 36mo	12-35mo		<12mo
Total Score	(add points from each section above)			

[1] Analgesic Agents

Agent	Age	When to use
LMX	≥ 37 weeks gestational age	1st line, when clinically able to wait 30min
J-Tip (lidocaine)	≥ 37 weeks gestational age	1st line, used immediately prior to procedure
Sucrose	< 6mo	Can use with other agents
Vapocoolant Spray (Pain Ease)	≥ 3yo	Clinically unable to wait 30min. Can be used with LMX.

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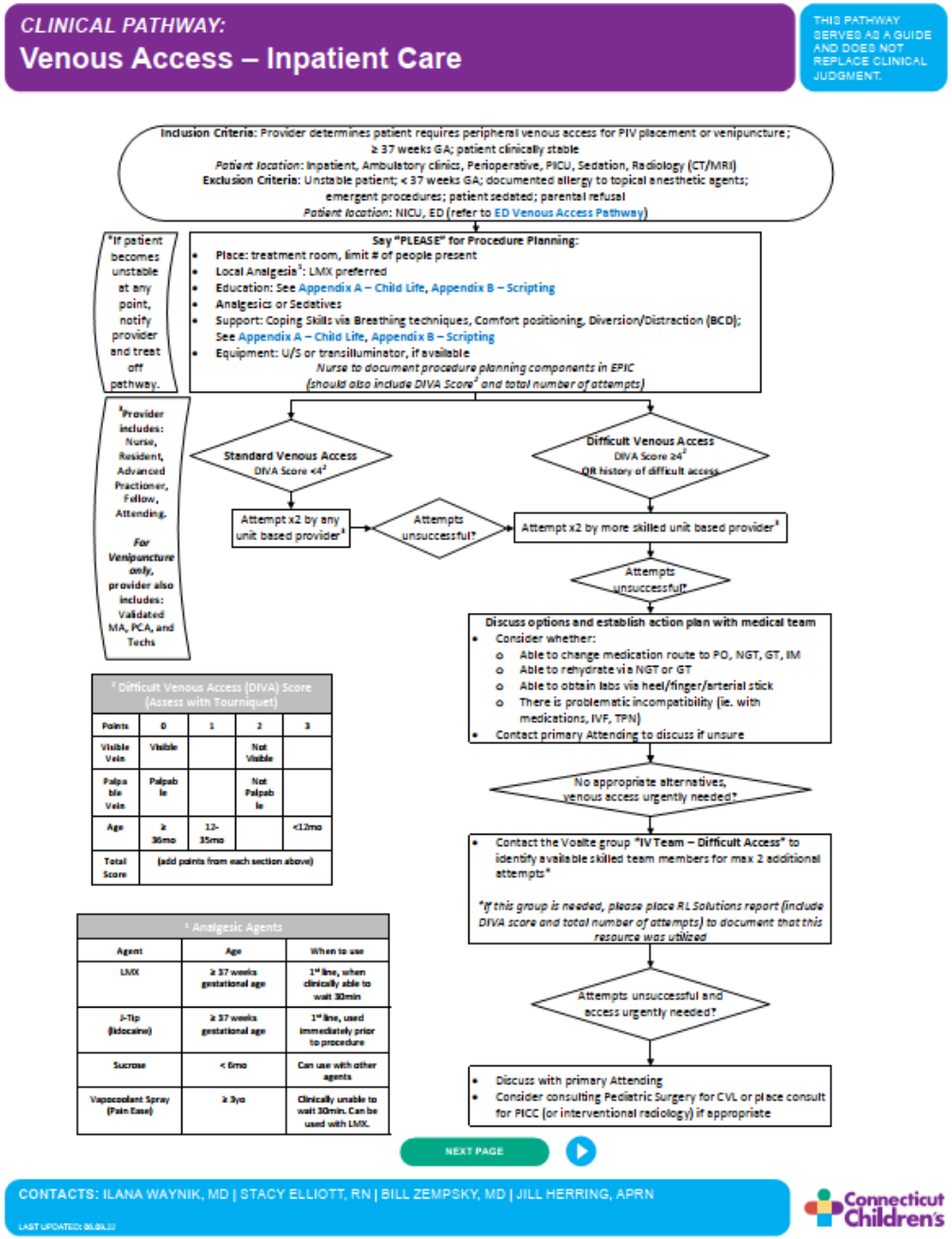
This is the Venous Access – Emergency Room Care Clinical Pathway.

We will be reviewing each component in the following slides.

This is the Venous Access –Inpatient Care Clinical Pathway.

The two pathways - Emergency Department Care and Inpatient Care - are similar in many ways. We will point out a few key differences while going through them.



CLINICAL PATHWAY:

Venous Access – Emergency Room Care

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.

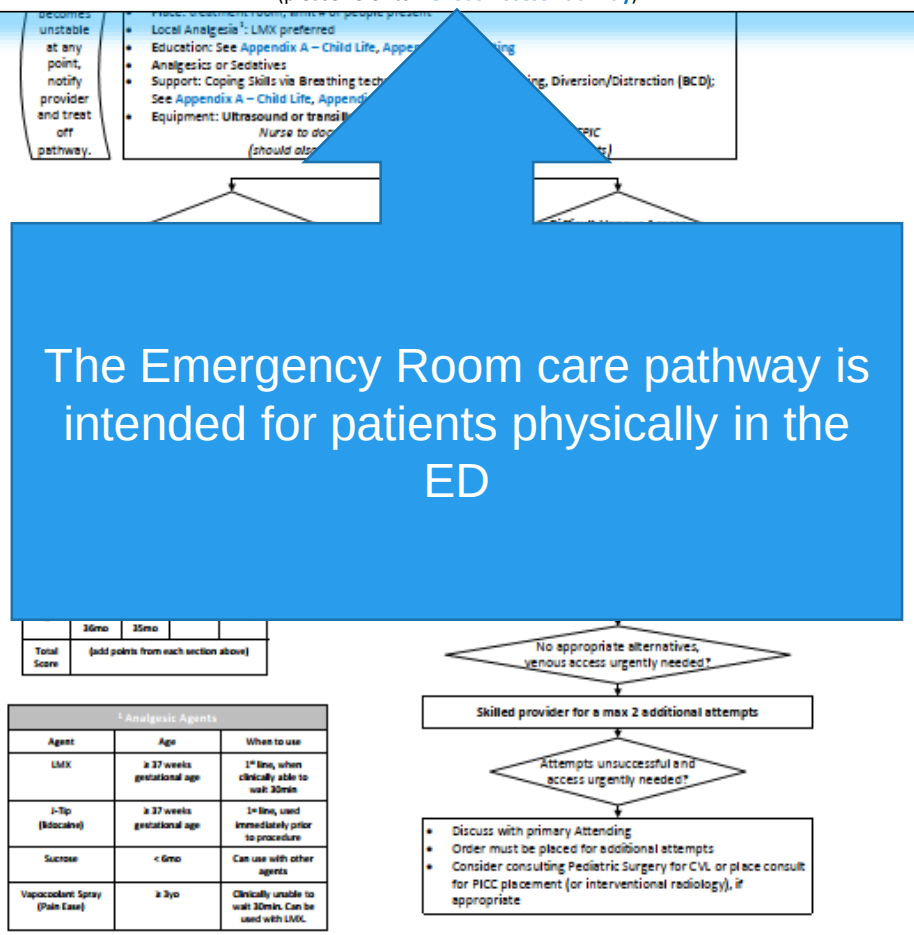
Inclusion Criteria: Provider determines patient requires peripheral venous access for PIV placement or venipuncture; ≥ 37 weeks GA; patient clinically stable

Patient location: ED

Exclusion Criteria: Unstable patient; < 37 weeks GA; documented allergy to topical anesthetic agents; emergent procedures; patient sedated; parental refusal

Patient location: Inpatient, Ambulatory clinics, Perioperative, PICU, Sedation, Radiology (CT/MRI)

(please refer to Venous Access Pathway)



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The Emergency Room care pathway is intended for patients physically in the ED

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CLINICAL PATHWAY:

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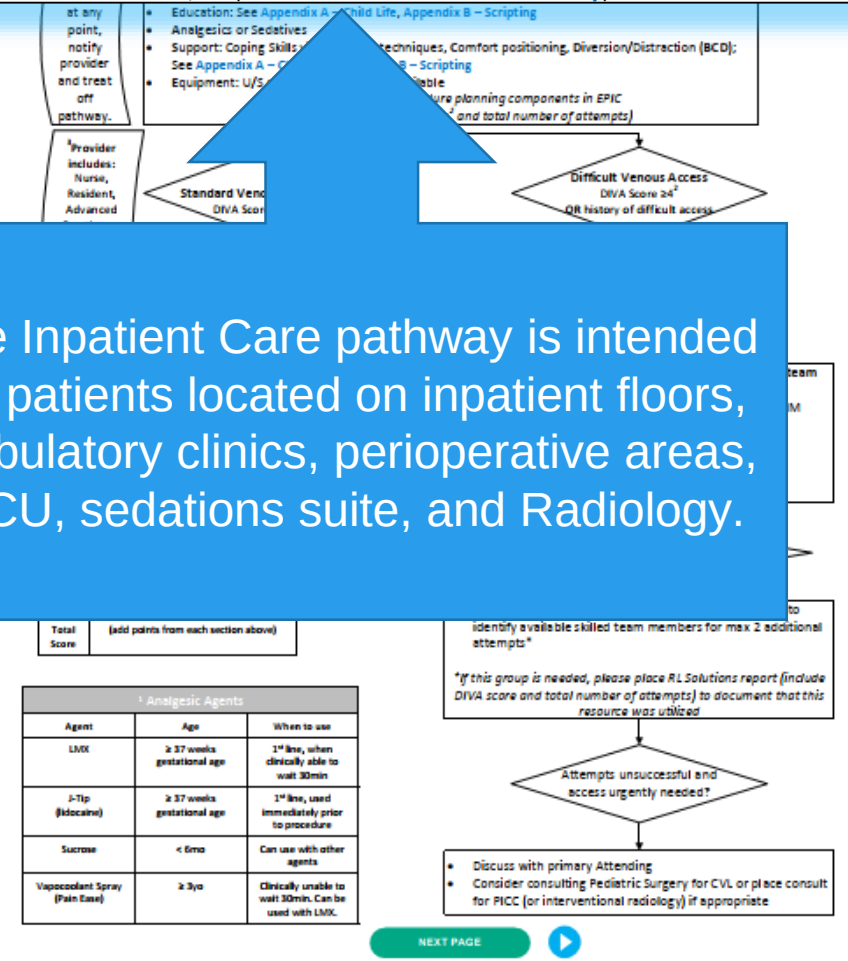
Patient location: Inpatient, Ambulatory clinics, Perioperative, PICU, Sedation, Radiology (CT/MRI)

Exclusion Criteria: Unstable patient; < 37 weeks GA; documented allergy to topical anesthetic agents; emergent procedures; patient sedated; parental refusal

Patient location: NICU, ED (refer to ED Venous Access Pathway)



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Vapocoolant Spray (Pain Ease)	≥ 3yo	Clinically unable to wait 30min. Can be used with LMX.

The Inpatient Care pathway is intended for patients located on inpatient floors, ambulatory clinics, perioperative areas, PICU, sedations suite, and Radiology.

NEXT PAGE

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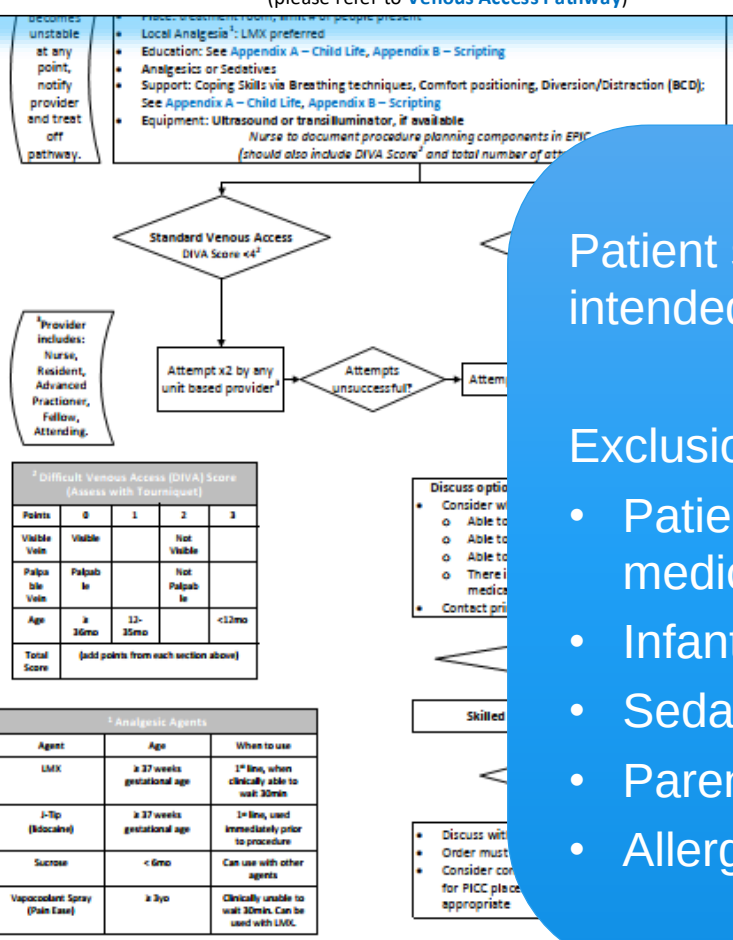
Patient location: ED

Exclusion Criteria: Unstable patient; < 37 weeks GA; documented allergy to topical anesthetic agents; emergent procedures; patient sedated; parental refusal

Patient location: Inpatient, Ambulatory clinics, Perioperative, PICU, Sedation, Radiology (CT/MRI) (please refer to Venous Access Pathway)



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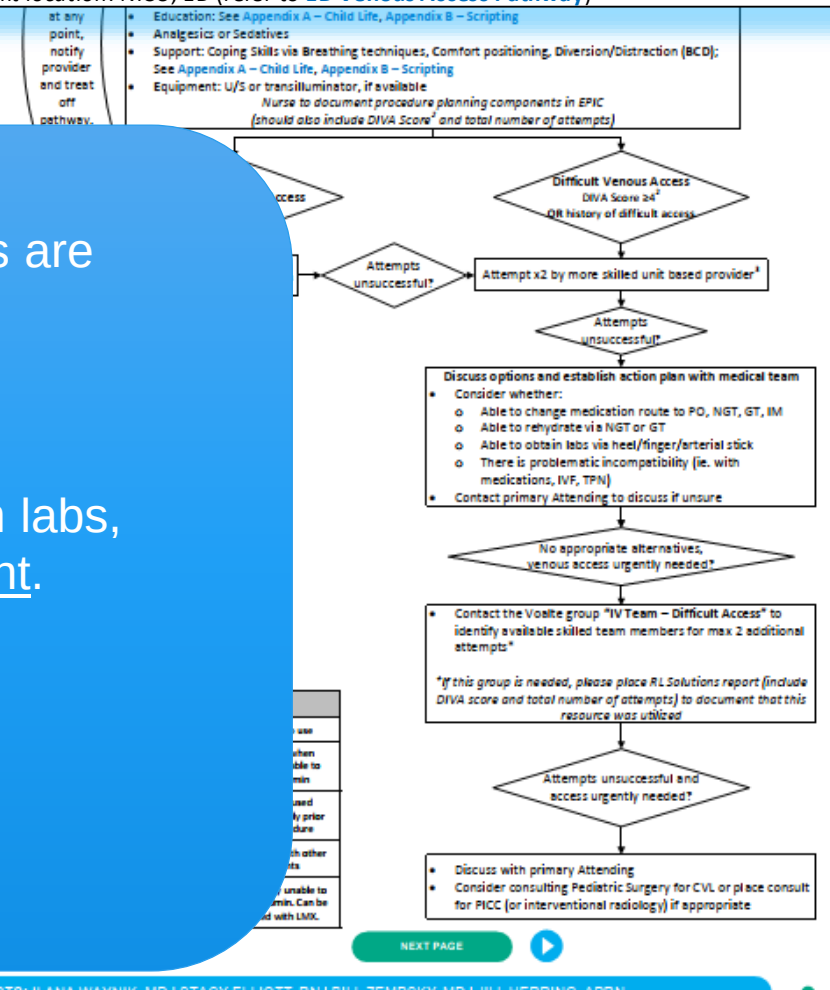
Patient location: NICU, ED (refer to ED Venous Access Pathway)



Patient safety comes first! Both pathways are intended for Clinically Stable patients.

Exclusion criteria includes:

- Patients who are unstable or for whom labs, medications, and/or fluids are emergent.
- Infant less than 37 week GA
- Sedated patients
- Parent or patient refusal
- Allergy to topical anesthetic agents

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Before Painful Procedures

Say:

Place

Local Anesthesia

Education

Analgesics

Support

Equipment

For more information please see the CCMC Painful Procedures Guidelines or speak with your Pain Team representative.

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CLINICAL PATHWAY:

Venous Access – Inpatient Care

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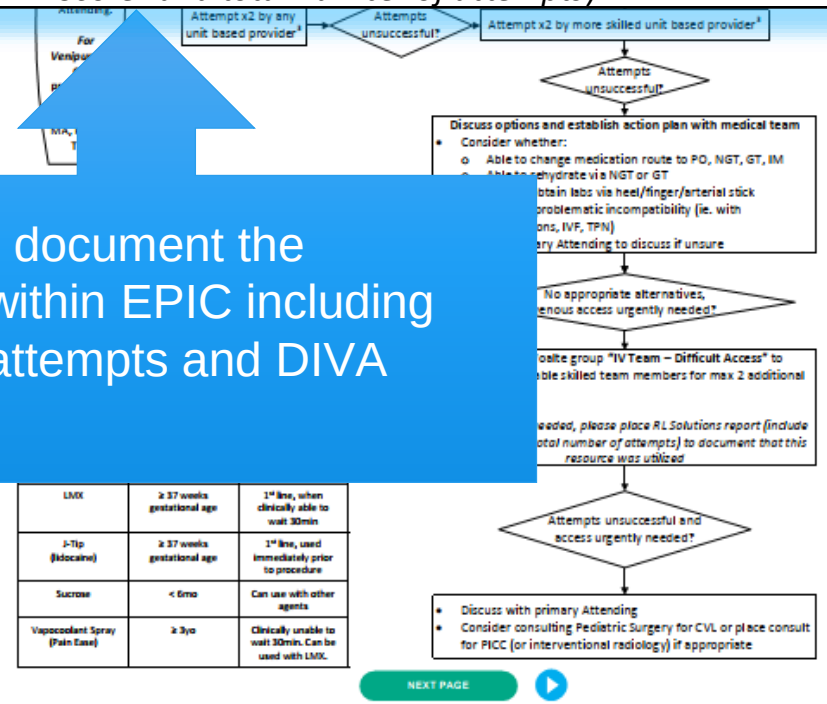
Say "PLEASE" for Procedure Planning:

- **P**lace: treatment room, limit # of people present
- **L**ocal Analgesia[1]: LMX preferred
- **E**ducation: See **Appendix A – Child Life**, **Appendix B – Scripting**
- **A**nalgesics or Sedatives
- **S**upport: Coping Skills via **B**reathing techniques, **C**omfort positioning, **D**iversion/Distraction (**BCD**); See **Appendix A – Child Life**, **Appendix B – Scripting**
- **E**quipment: U/S or transilluminator, if available

Nurse to document procedure planning components in EPIC (should also include DIVA Score[2] and total number of attempts)



Nursing will document the procedure within EPIC including number of attempts and DIVA score

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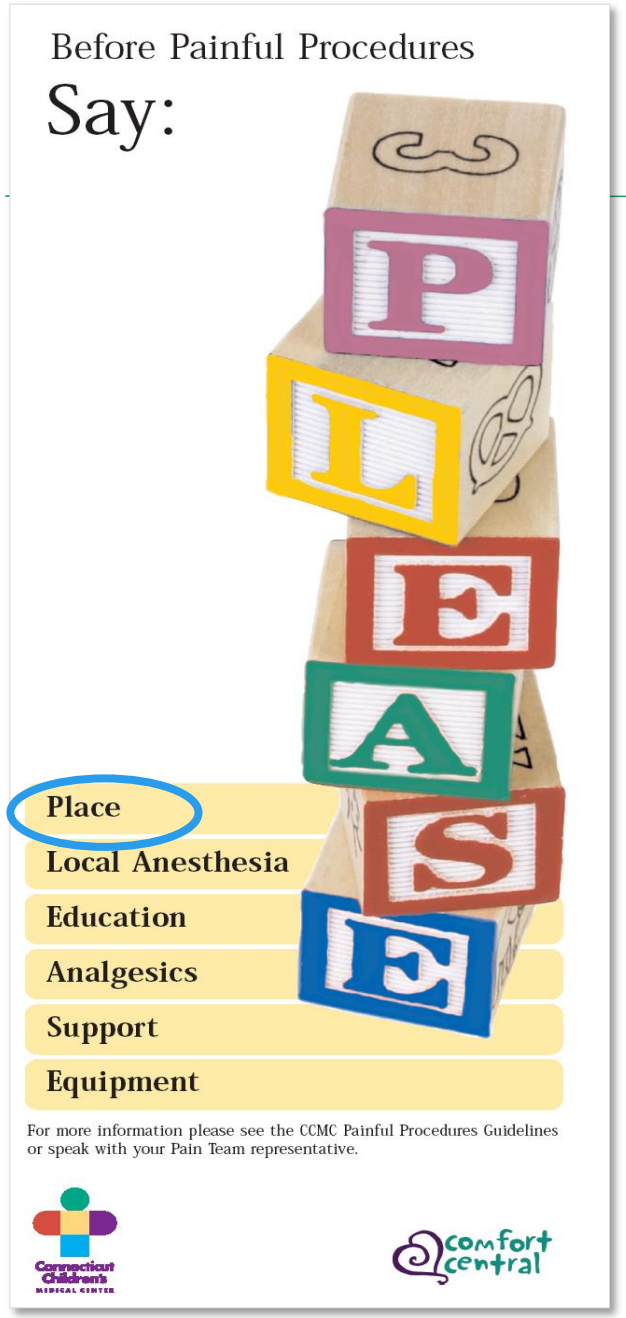
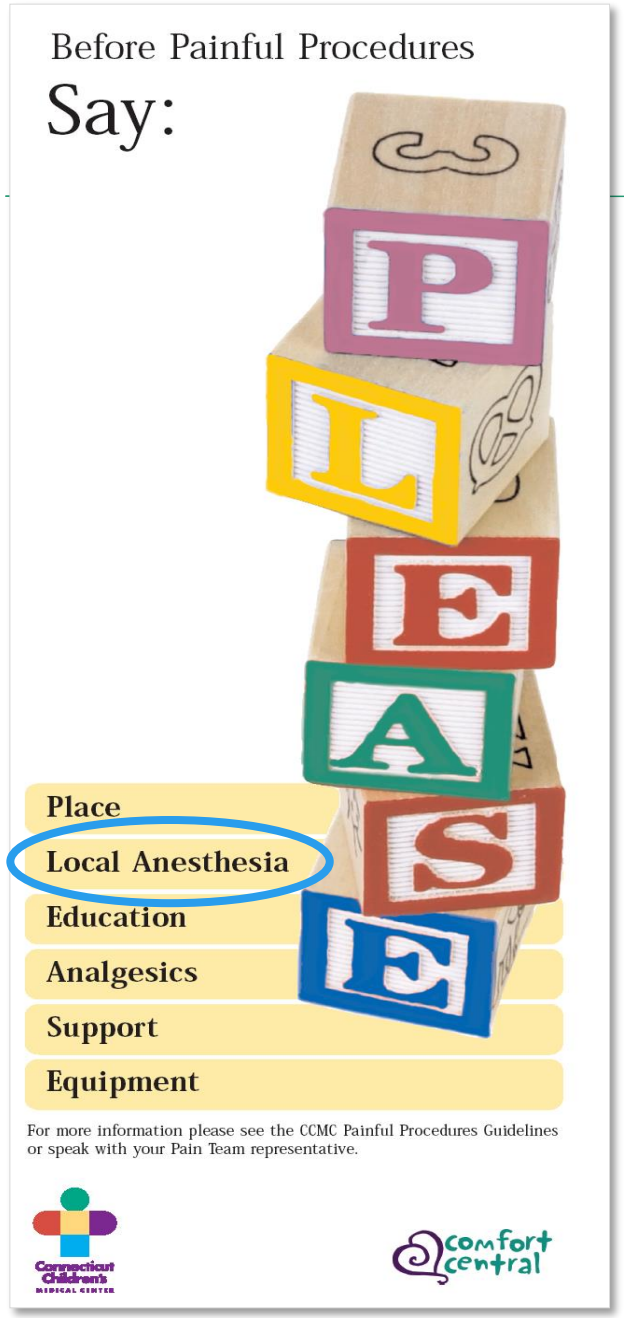


P: Place

Treatment Room

- Private, calm, soundproof
- Keeps bedroom safe place
- Isolation patients can go to the treatment room (ensure room is appropriately cleaned after use)
- Treatment room monitor can be used (not central monitoring)
- Call bell in room for emergency
- Limit # of people present



L: Local Anesthesia

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LMX

J-Tip

Pain Ease

Sucrose

Why do we need this?

- To reduce unnecessary pain and suffering from procedure
- Pain experiences early in life can have long term physiological, psychological and behavioral effects
- To improve procedural success rate and decrease procedure time

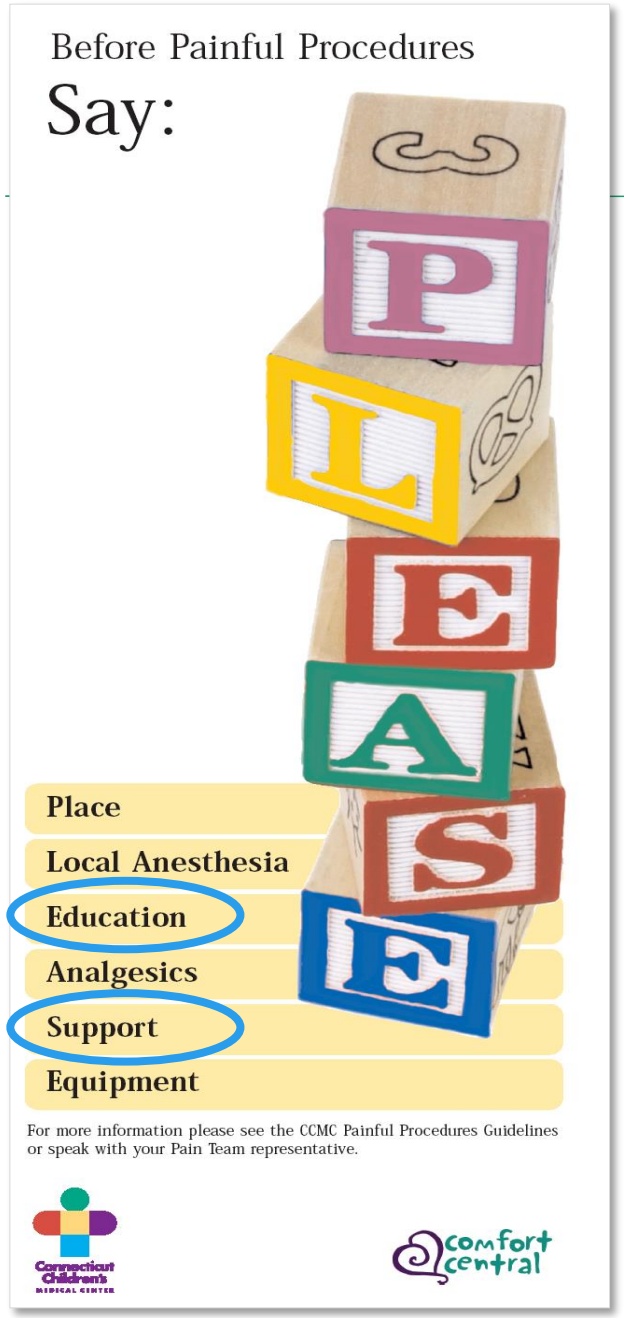
L: Local Anesthesia

	LMX	Pain Ease	Sucrose	J-Tip & STAQ Lidocaine
				
Who?	• Children >/= 37 weeks GA	• Age ≥3yo • Developmentally able to understand cooling sensation to skin	• Infants < 6 months	• Children >/= 37 weeks GA • Adequate subcutaneous tissue
When?	• First line when clinically able to wait 30 minutes • Preference for LMX Over Pain Ease (LMX more effective than Pain Ease)	• Not enough time to use LMX (< 30 minutes) • Not as effective as topical LMX	• Any painful procedure • In combination with a topical analgesic	• Any needle procedure • When procedure is time-sensitive (effect in 1-2 minutes)
How?	• Requires an order • <4 years: 1 g applied to site • 4 to 17 years: 1 to 2.5 g applied to site • Note: For peripheral IV cannulation, some have recommended application to 6.25 cm2 of skin • 1 tube contains net 5g • Should not exceed 3-4 topical doses per day • Can be in two different places at the same time	• Requires an order • Spray treatment area continuously for 4 to 10 seconds from a distance of 8 to 18 cm (3 to 7 inches) until skin just turns white. Do not frost skin/area. Avoid spraying of target area beyond this state. With skin taut, quickly introduce needle. Reapply as needed Concerns with use • Requires appropriate technique • Expensive	• Requires an order • Administer 2ml of 25% solution by syringe into the infant's mouth (1ml each cheek) or allow infant to suck solution from a nipple (pacifier) for no more than 2 minutes before start of painful procedure • May be given for >1 procedure within a relatively short period of time, but it may not be effective if administered more than twice in 1h • More effective when given in combination with a pacifier; nonnutritive suck also contributes to calming infant and decreasing pain-elicited distress	• Requires an order for the STAQ Lidocaine • Dose for all patients is 0.2ml • J-Tip to be filled with 0.2ml from STAQ Lidocaine pre-filled syringe • Z-track method is preferred for delivery of Lidocaine near vein • Needle should be held at a 90 degree angle, and held in place for 2-3 seconds after administration • Massage the injection site with gauze to evenly distribute • Area will be fully numb in 1-2 minutes
Contraindications	• Hypersensitivity to lidocaine or any component of formulation • Hypersensitivity to another local anesthetic of amide type • Traumatized mucosa • Bacterial infection at site of application	• Hypersensitivity to pentafluoropropane, tetrafluoroethane or any other component of formulation	• Suggestion that neonates should not receive > 10 doses in a 24h period of time	• Allergy to Lidocaine • Not recommended for use over ports • Precaution should be taken in patients taking blood thinners, who have blood diseases and those undergoing chemotherapy

LMX Mythbusters

LMX

MYTH	CURRENT EVIDENCE
Myth #1 • LMX causes systemic vasoconstriction	• Compared to EMLA cream, LMX causes less skin blanching and vasoconstriction • Data shows increased rates of cannulation on first attempt Cregin et al. “Improving pain management for pediatric patients undergoing nonurgent painful procedures.” Am J Health-Syst Pharm. Vol 65. 2008.
Myth #2 • LMX can only be used for insect bites	• LMX is used as a local anesthetic
Myth #3 • EMLA is on formulary at Connecticut Children’s	• LMX is on formulary at Connecticut Children’s • EMLA is NOT available
Myth #4 • LMX is not appropriate for infants or patient’s with difficult IV access	• Shorter IV cannulation time and higher procedure success rate compared to placebo • Less stress and trauma Zempsky. “Pharmacologic approaches for reducing venous access pain in children“ Pediatrics. 2008.



E: Education
S: Support

- Child life consult/support
  - Available during business hours (unit based)
  - In-house pager on weekends during business hours
- Age appropriate preparation for procedure
- Training for coping skills
- Comfortable environment
- Distraction
- Education for parents of how they can support their child
- Includes breastfeeding/skin to skin contact for infants

Before Painful Procedures

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- **A**nalgesics or Sedatives
- **S**upport: Coping Skills via **B**reathing techniques, **C**omfort positioning, **D**iversion/Distraction (**BCD**); See **Appendix A – Child Life**, **Appendix B – Scripting**
- **E**quipment: **Ultras d or transilluminator, if available**

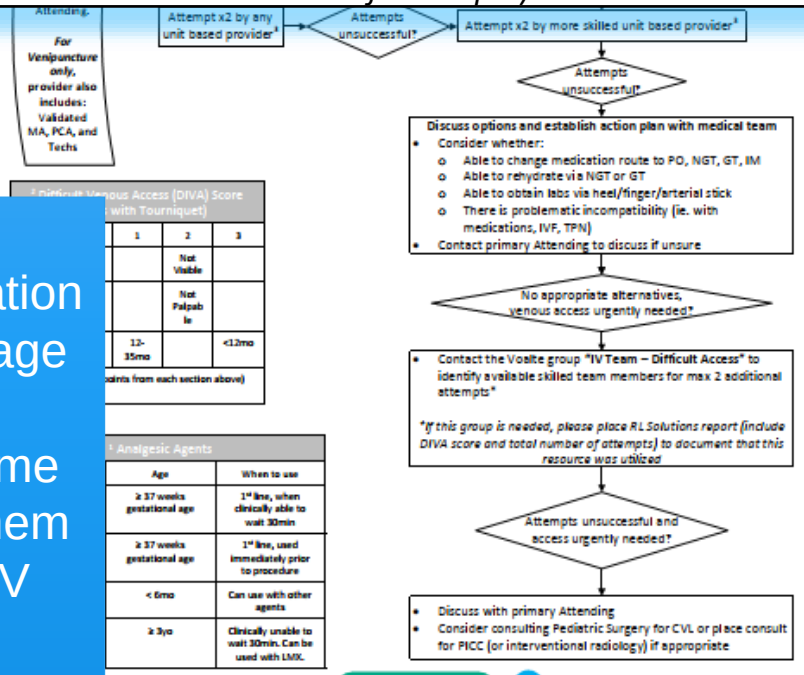
to document procedure planning components in EPIC

include DIVA Score[2] and total number of attempts)

Appendix A: is a document with developmentally appropriate education and support information sorted by age group.

Appendix B: is a document with some scripting ideas for nurses to help them talk to patients and families about IV placement

See next slides



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Appendix A

E: Education
S: Support

Peripheral Venous Access Pathway: Behavioral Recommendations

Child Life/Developmental Considerations by Age Group:

Infant (0-12 months)	Toddler (12months-3 years)	Pre-School (3-6 years)
▪ Parental involvement and support ▪ Comfort Positioning (swaddle) ▪ Creating a calm soothing environment (music, dim lighting if possible) ▪ If parents unavailable, consider child life as calming/supportive presence ▪ Consider Sucrose/topical pain management ▪ **Best Techniques:** Skin-to-skin contact, pacifier, singing, talking, rattles & toys, stroking the baby's head, patting & positive touch	▪ Parental involvement and support ▪ Comfort Positioning (sitting on a parent's lap, chest to chest, chest to back hug/hold) ▪ Limit unnecessary caregivers/providers ▪ Topical pain management ▪ Provide distraction (Page child life) ▪ **Best techniques:**, bubbles & pinwheel, singing, counting, reading, visual block *Distraction items*: interactive apps iPad/phone, music, videos, flap books, wands, toys/books that light up ▪ Language-use familiar words and phrases ▪ Treatment Room Use	▪ Parental involvement and support ▪ Comfort Positioning (sitting on a parent's lap, chest to chest, chest to back hug/hold) ▪ Limit unnecessary caregivers/providers ▪ Offer choices ▪ Topical pain management and/or buzzy ▪ Page child life: basic preparation, distraction/coping techniques ▪ **Best techniques:**, bubbles & pinwheel, singing, counting, reading, visual block *Distraction items*: interactive apps iPad/phone, music, videos, flap books, wands, toys/books that light up ▪ Language/careful word choice- magical thinkers ▪ Treatment Room Use ▪ Debrief

School-Age (7-12 years)	Teen/Young Adults (13 years and older)	Other considersations:
▪ Parental involvement and support ▪ Comfort positioning ▪ Education/preparation ▪ Provide choices to child (would they like to watch, look away, can they "help") ▪ Topical pain management and/or buzzy ▪ Page child life: preparation, distraction/coping ▪ **Best techniques:** Breathing/blowing, counting, talking about something else, joking *Distraction items*: iPad/phone, music, videos, I-Spy book, relaxation/guided imagery ▪ Language/careful word choice- abstract thinkers ▪ Treatment Room Use ▪ Debrief	▪ Provide choices/participation ▪ Education/Preparation ▪ Page child life for anxious patients: preparation, distraction/coping ▪ Topical pain management and/or buzzy ▪ **Best techniques:** Breathing/blowing, talking about something else, *Distraction items:* iPad/phone, music (with or without headphones), videos, relaxation/guided imagery ▪ Debrief/Process	▪ Consider developmental age vs. chronological age ▪ Avoid use of "almost done" ▪ Avoid use of "it's only" or "it's just" ▪ Never says ALL DONE until you are actually all done/no need for any final steps ▪ Timing

Appendix B

E: Education
S: Support

Topical Talk 101:

Are you tongue tied talking to patients and families about topical anesthetics? Here is some scripting to guide you.

FOR PATIENTS

(based on developmental level/age/previous experience/knowledge of patient)

LMX:

- "The nurse will put a special cream on your (arm/hand) that makes your skin numb."
- "Do you know what "numb" means?" "So you won't feel it so much" (use teachback).
- Most kids tell me that it helps so the (poke/needle/pinch) won't hurt (AS/SO) much. **(IMPORTANT: do not promise no pain or no feeling of needle insertion)**
- "Most kids say they still feel touching/pushing/pressure but the cream is a helper that makes it easier."

- "First, the nurse may need to find the right spot for your cream."
- "They may use the tight orange band/rubber band/squeeze band on your arm, feel with only their fingers, put on some cream, cover with a clear bandage/tape/sticker."
- "The cream will stay on for 30 minutes/as long as one …. " (30 minute TV show, or other "time" example they can understand).

PAIN EASE:

- "We can use a cold/freezie spray (ELSA/OLAF for preschool/young school age) to help make your skin numb (so you won't feel it so much)."
- "Most kids tell me that it helps so the (poke/needle/pinch) won't hurt (AS/SO) much." **(IMPORTANT: do not promise no pain, no feeling of needle insertion)**
- "Most kids say the cold is REALLY cold (like holding an ice cube/snow for a long time), some kids say the cold is uncomfortable, but is easier than feeling pinch/poke/needle."
- "The nurse will clean your skin first, spray it for 10 seconds (we can count together) or until your skin turns white and then do the IV (tube)/blood test right away."

J TIP:

- "This is a special tool that sprays numbing medicine on your skin so that the poke won't hurt as much."
- "This tool will make a noise like a soda can opening."
- "You will feel a quick big puff of air and it might feel wet. It will start to work in 1-2 minutes)

FOR PARENTS

LMX:

- "Cream that helps to numb the skin/area for IV, may not take all pain away, but is helpful."
- "Patient will still feel pressure/touching."
- "Cream must stay on for 30 minutes to be most effective."
- "We can provide preparation for support for all of the steps."

CLINICAL PATHWAY:
Venous Access – Inpatient Care
Appendix B: Scripting

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.

PAIN EASE:

- "Cold spray that can be used to numb the skin/area for IV."
- "The spray itself is uncomfortably cold, but most children prefer this to feeling of needle insertion. (needs to be sprayed for up to 10 seconds- or until skin turns white-to work)."
- "We can provide preparation for support for all of the steps."

J TIP:

- "A J TIP is a device that has pressurized lidocaine in it so it can spray into/under the skin to numb the area where the needle will go in."
- "It makes a loud noise which can be startling but we can prepare your child for it and make it into something fun (like a rocket ship blastoff)."
- "Your child may feel a quick burst of air but they should not have pain from it."
- "It is normal to see a small bullseye and possible spot of blood from where it was sprayed."

RETURN TO THE BEGINNING

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LAST UPDATED: 06.09.22

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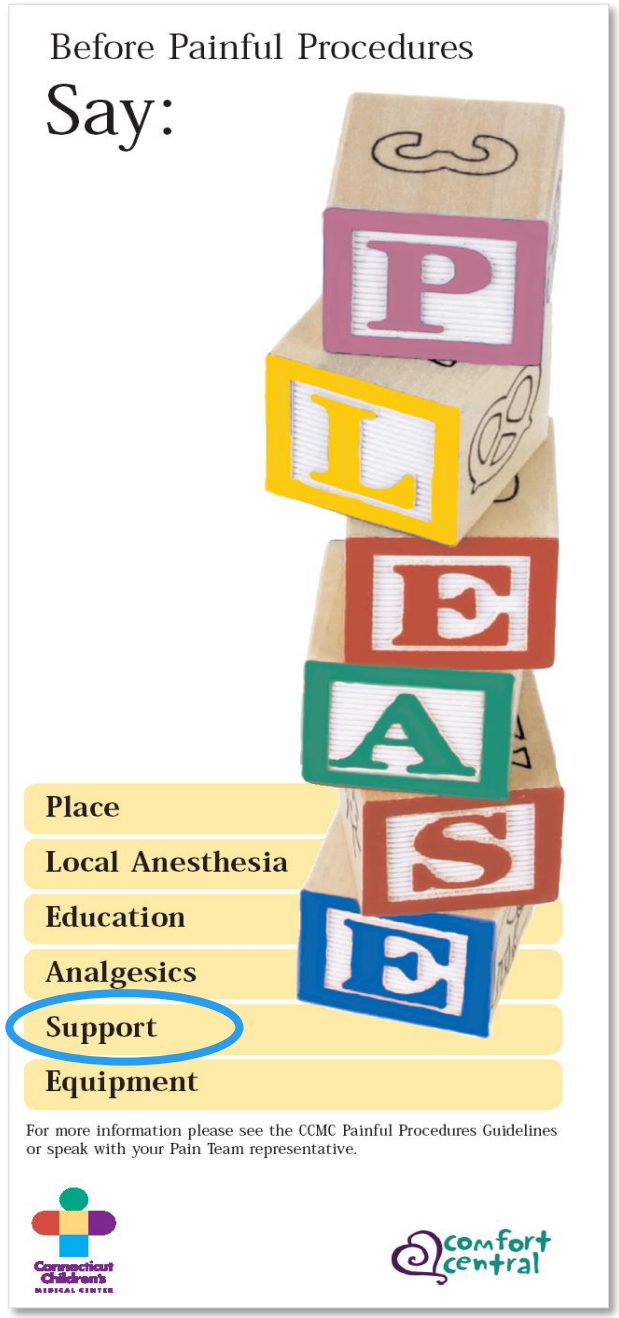
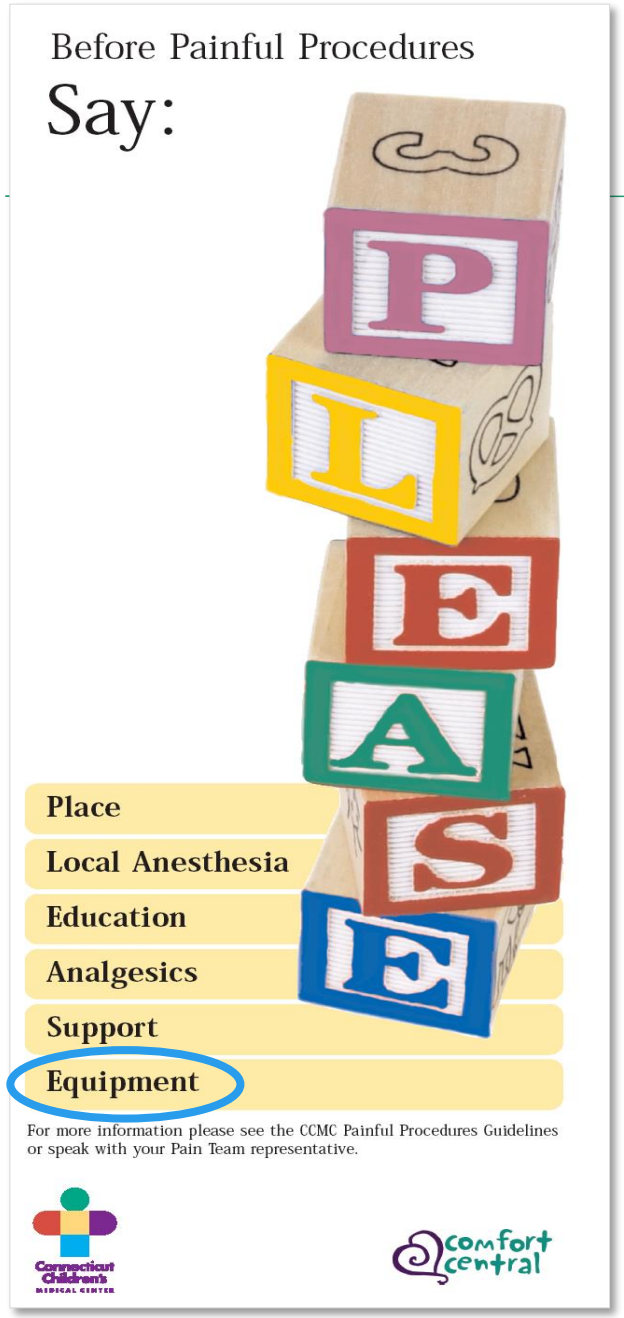


S: Support

Distraction is a great way to support children through IV placement

A Coping toolkit will be available in every treatment room.



E: Equipment

- Transilluminator and Ultrasound are available
- Some pediatric residents are being trained in placing PIVs using ultrasound-guidance
- You can ask residents for help if traditional methods are unsuccessful or for patients with difficult venous access

CLINICAL PATHWAY:

Venous Access – Emergency Room Care

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.

Inclusion Criteria: Provider determines patient requires peripheral venous access for PIV placement or venipuncture; ≥ 37 weeks GA; patient clinically stable
Patient location: ED
Exclusion Criteria: Unstable patient; < 37 weeks GA; documented allergy to topical anesthetic agents; emergent procedures; patient sedated; parental refusal
Patient location: Inpatient, Ambulatory clinics, Perioperative, PICU, Sedation, Radiology (CT/MRI)
(please refer to Venous Access Pathway)

*If patient becomes unstable at any point, notify provider and treat off pathway.

Say "PLEASE" for Procedure Planning:
- Place: treatment room, limit # of people present
- Local Analgesia[1]: LMX preferred
- Education: See Appendix A – Child Life, Appendix B – Scripting
- Analgesics or Sedatives
- Support: Coping Skills via Breathing techniques, Comfort positioning, Diversion/Distraction (BCD); See Appendix A – Child Life, Appendix B – Scripting
- Equipment: Ultrasound or transilluminator, if available

Nurse to document procedure planning components in EPIC (should also include DIVA Score[2] and total number of attempts)

Standard Venous Access
DIVA Score <4[2]

Difficult Venous Access
DIVA Score ≥4[2]
OR history of difficult access

[3]Provider includes: Nurse, Resident, Advanced Practioner, Fellow, Attending.

Attempt x2 by any unit based provider[3]

Attempts unsuccessful?

Attempt x1 by any unit based provider[3]

Attempt x2 by more skilled provider[3]

Discuss options and establish action plan with medical team
- Consider whether:
  - Able to change medication route to PO, NGT, GT, IM
  - Able to rehydrate via NGT or GT
  - Able to obtain labs via heel/finger/arterial stick
  - There is problematic incompatibility (ie. with medications, IVF, TPN)
- Contact primary Attending if unsure

No appropriate alternatives, venous access urgently needed?

Skilled provider for a max 2 additional attempts

Attempts unsuccessful and access urgently needed?

- Discuss with primary Attending
- Order must be placed for additional attempts
- Consider consulting Pediatric Surgery for CVL or place consult for PICC placement (or interventional radiology), if appropriate

[2] Difficult Venous Access (DIVA) Score (Assess with Tourniquet)

Points	0	1	2	3
Visible Vein	Visible		Not Visible	
Palpable Vein	Palpable		Not Palpable	
Age	≥ 36mo	12-35mo		<12mo
Total Score	(add points from each section above)			

[1] Analgesic Agents

Agent	Age	When to use
LMX	≥ 37 weeks gestational age	1st line, when clinically able to wait 30min
J-Tip (lidocaine)	≥ 37 weeks gestational age	1st line, used immediately prior to procedure
Sucrose	< 6mo	Can use with other agents
Vapocoolant Spray (Pain Ease)	≥ 3yo	Clinically unable to wait 30min. Can be used with LMX.

In both pathways nurses will evaluate the patient's Difficult Venous Access (DIVA) Score. This will help guide the next steps taken.

CONTACTS: ILANA WAYNIK, MD | STACY ELLIOTT, RN | BILL ZEMPSKY, MD | RYAN O'DONNELL, RN

CLINICAL PATHWAY:

Venous Access – Inpatient Care

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.

Inclusion Criteria: Provider determines patient requires peripheral venous access for PIV placement or venipuncture; ≥ 37 weeks GA; patient clinically stable
Patient location: Inpatient, Ambulatory clinics, Perioperative, PICU, Sedation, Radiology (CT/MRI)
Exclusion Criteria: Unstable patient; < 37 weeks GA; documented allergy to topical anesthetic agents; emergent procedures; patient sedated; parental refusal
Patient location: NICU, ED (refer to ED Venous Access Pathway)

*If patient becomes unstable at any point, notify provider and treat off pathway.

Say "PLEASE" for Procedure Planning:
- Place: treatment room, limit # of people present
- Local Analgesia[1]: LMX preferred
- Education: See Appendix A – Child Life, Appendix B – Scripting
- Analgesics or Sedatives
- Support: Coping Skills via Breathing techniques, Comfort positioning, Diversion/Distraction (BCD); See Appendix A – Child Life, Appendix B – Scripting
- Equipment: U/S or transilluminator, if available

Nurse to document procedure planning components in EPIC (should also include DIVA Score[2] and total number of attempts)

Standard Venous Access
DIVA Score <4[2]

Difficult Venous Access
DIVA Score ≥4[2]
OR history of difficult access

[3]Provider includes: Nurse, Resident, Advanced Practioner, Fellow, Attending.

For Venipuncture only, provider also includes:

Standard Venous Access DIVA Score <4[2]

Attempt x2 by any unit based provider[3]

Attempts unsuccessful?

Attempts unsuccessful?

Discuss options and establish action plan with medical team
- Consider whether:
  - Able to change medication route to PO, NGT, GT, IM
  - Able to rehydrate via NGT or GT
  - Able to obtain labs via heel/finger/arterial stick
  - There is problematic incompatibility (ie. with medications, IVF, TPN)
- Contact primary Attending if unsure

No appropriate alternatives, venous access urgently needed?

- Contact the Voalte group "IV Team – Difficult Access" to identify available skilled team members for max 2 additional attempts:*

*If this group is needed, please place RL Solutions report (include DIVA score and total number of attempts) to document that this resource was utilized

Attempts unsuccessful and access urgently needed?

- Discuss with primary Attending
- Consider consulting Pediatric Surgery for CVL or place consult for PICC (or interventional radiology) if appropriate

[1] Analgesic Agents

Agent	Age	When to use
LMX	≥ 37 weeks gestational age	1st line, when clinically able to wait 30min
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NEXT PAGE

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The Difficult Venous Access score aka The DIVA score

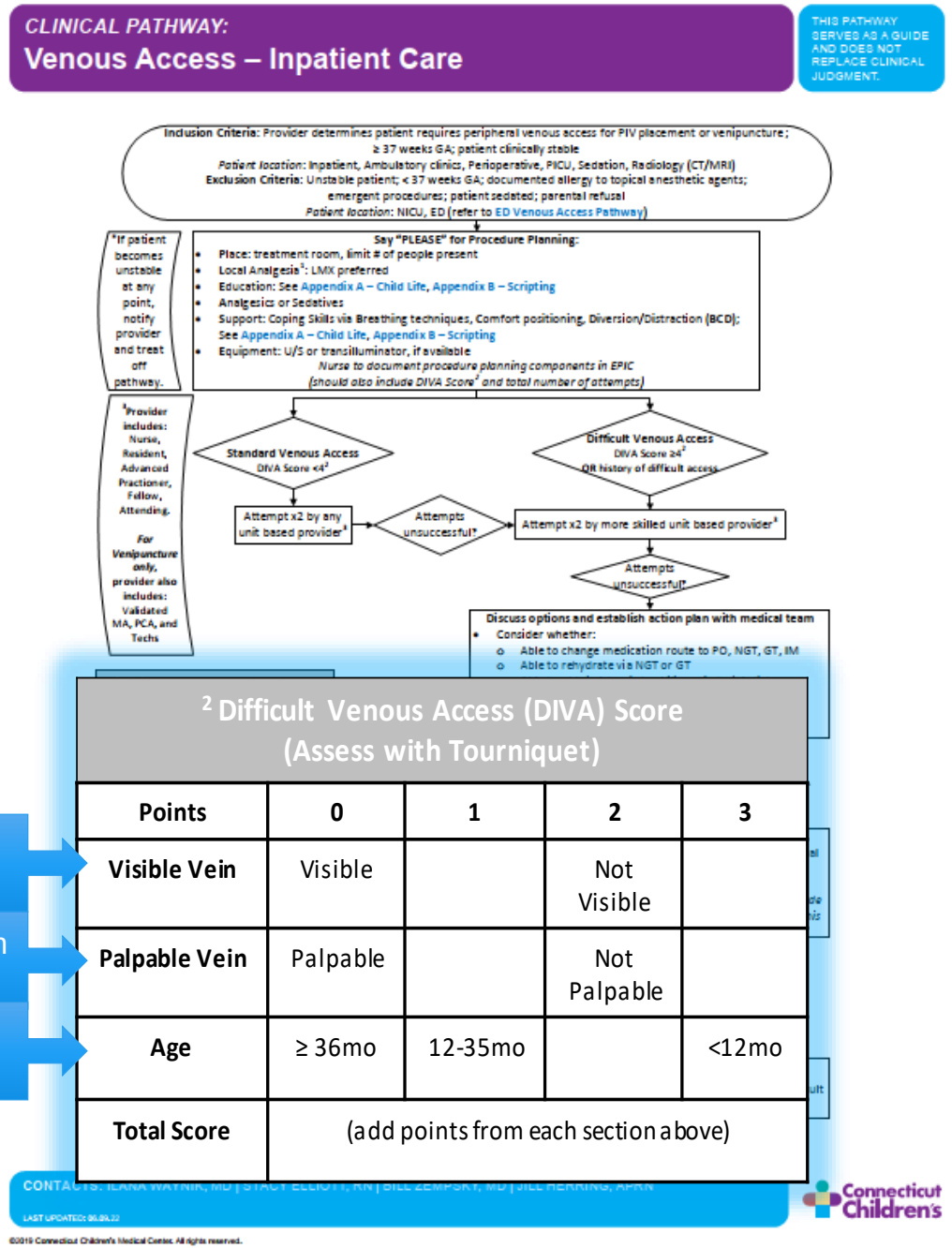
What is it? and why do we use it?

- Easy clinical predictive rule
- Average failure rate of 25% on 1st attempt for IV access
- DIVA score 4 or greater = more than 50% likelihood of failed first attempt
- Allows staff to utilize appropriate resources

The ability to **SEE** the vein after tourniquet is placed

The ability to **FEEL** the vein after tourniquet is placed

Patient's age in months



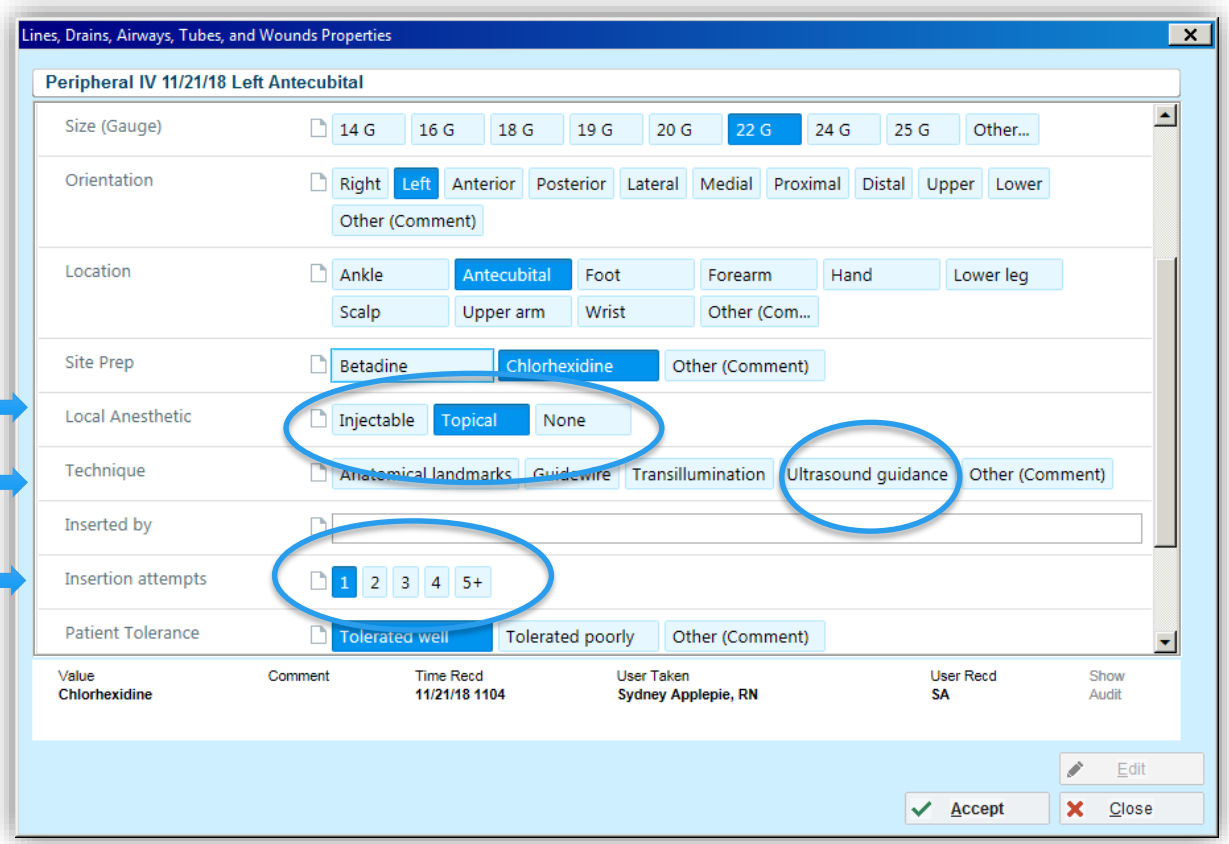
Nursing Procedural Documentation

Nursing will document the procedure of PIV placement

COMPLETE!!!!!

COMPLETE!!!!!

COMPLETE!!!!!



CLINICAL PATHWAY:

Venous Access – Emergency Room Care

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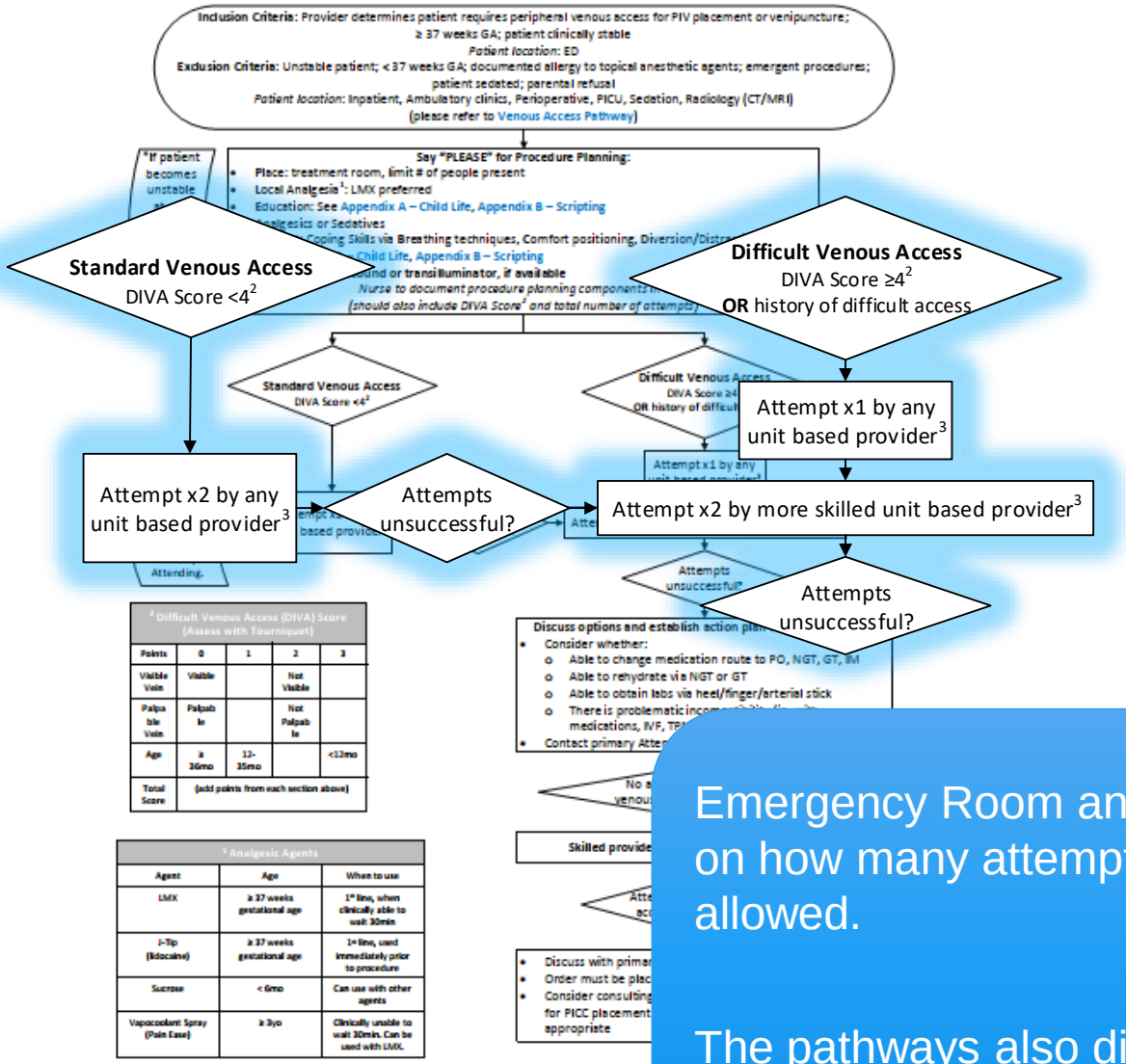

[2] Difficult Venous Access (DIVA) Score (Assess with Tourniquet)

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CLINICAL PATHWAY:

Venous Access – Inpatient Care

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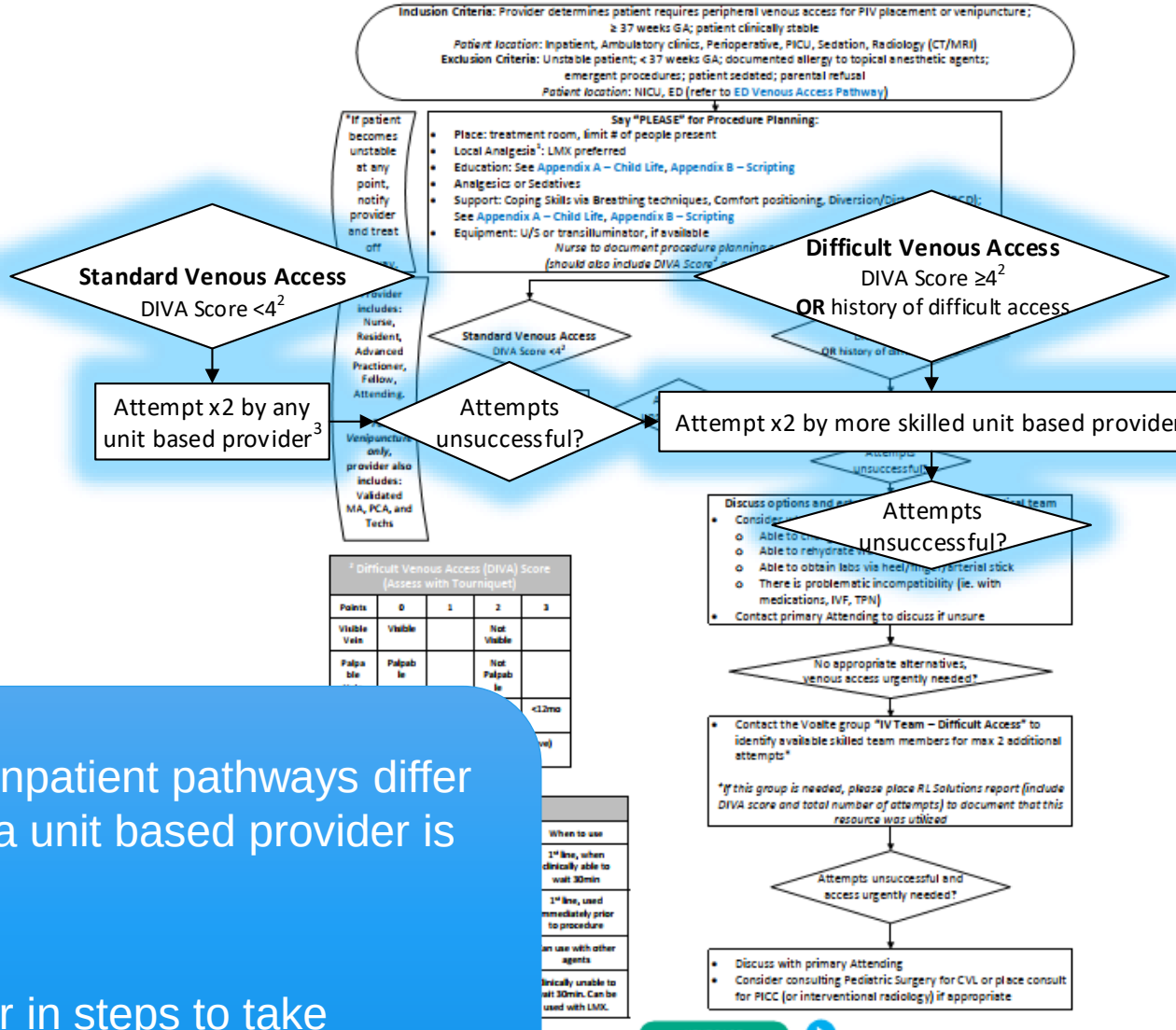

[2] Difficult Venous Access (DIVA) Score (Assess with Tourniquet)

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Emergency Room and Inpatient pathways differ on how many attempts a unit based provider is allowed.

The pathways also differ in steps to take following unsuccessful attempts.

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LIOTT, RN | BILL ZEMPSKY, MD | JILL HERRING, APRN

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CLINICAL PATHWAY:

Venous Access – Emergency Room Care

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.

CLINICAL PATHWAY:

Venous Access – Inpatient Care

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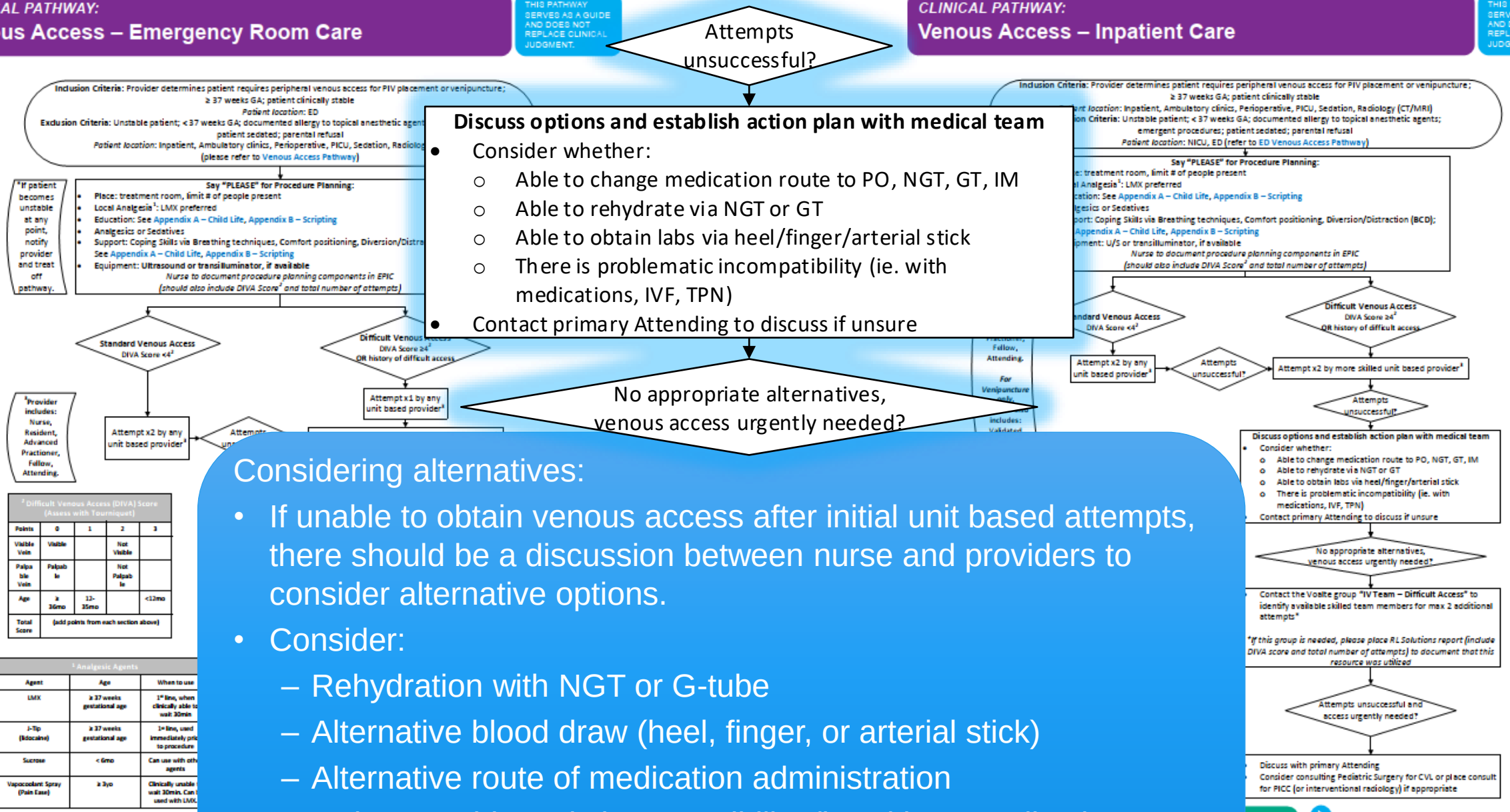
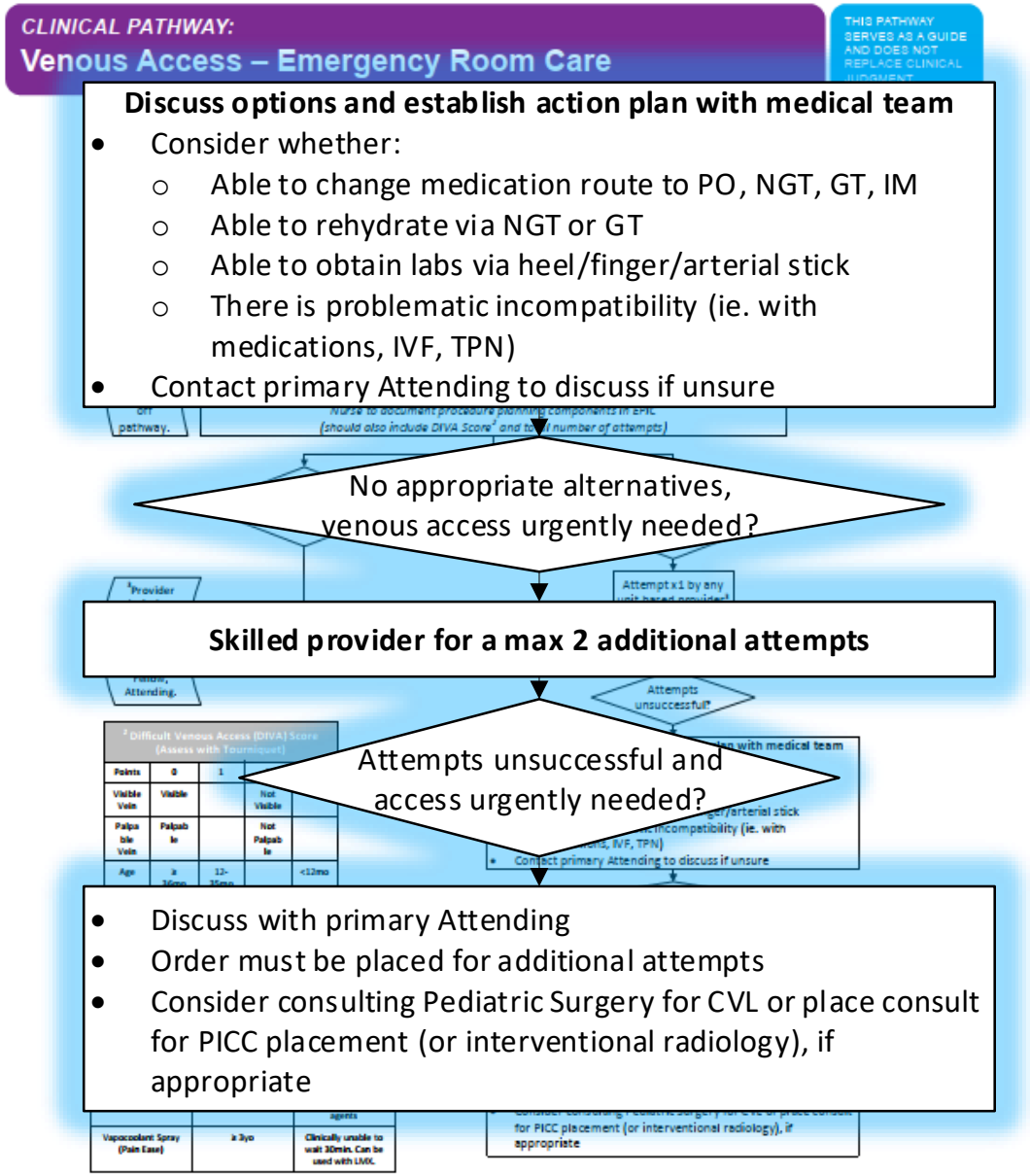


CONTACTS: ILANA WAYNIK, MD | STACY ELLIOTT, … | … Y, MD | JILL HERRING, APRN



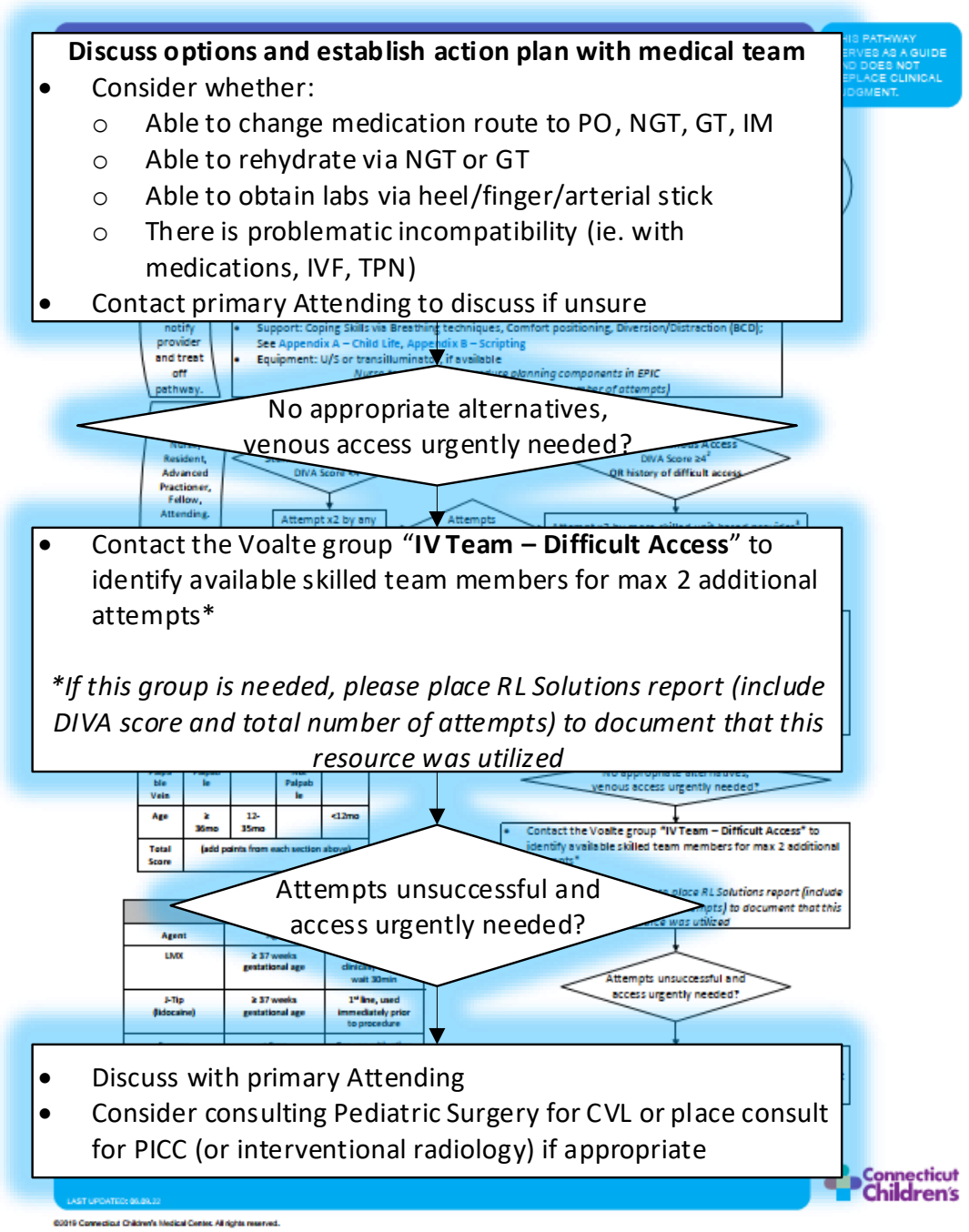
In the ED, if IV access is determined to be urgently needed, unit based providers may try 2 more times.

If still unsuccessful there must be a discussion of next steps with the primary Attending.

CONTACTS: ILANA WAYNIK, MD | STACY ELLIOTT, RN | BILL ZEMPSKY, MD | RYAN O'DONNELL, RN

Using the Inpatient Pathway, if IV access is determined to be urgently needed, nursing first contacts an alternative resources by contacting the Voalte group "**IV Team – Difficult Access**" to identify available skilled team members for max 2 additional attempts

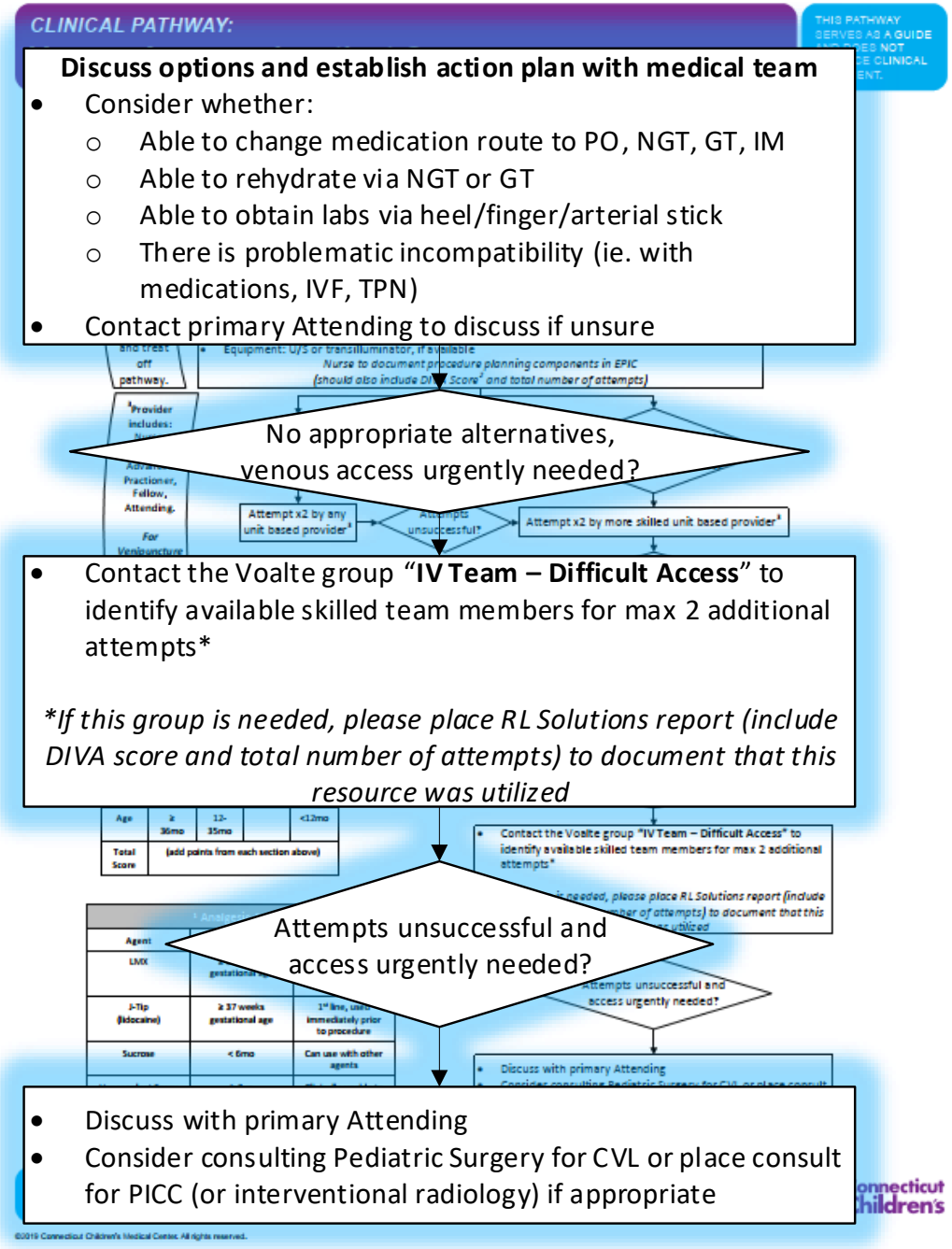
**If this group is needed, please place RL Solutions report (include DIVA score and total number of attempts) to document that this resource was utilized*



For both ED and Inpatient:

If still unable to obtain access:

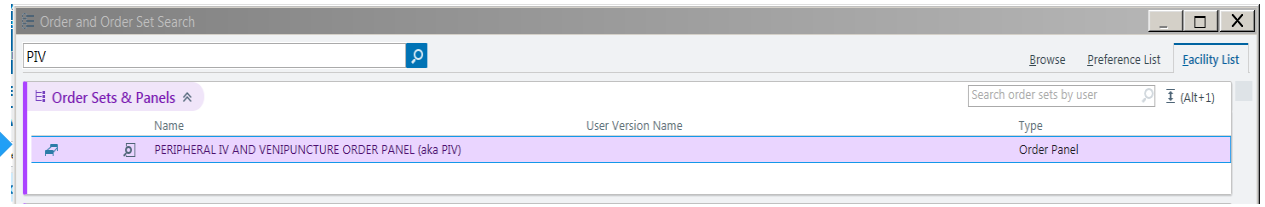
- Consider consulting Pediatric Surgery for CVL or place consult for PICC (or interventional radiology) if appropriate



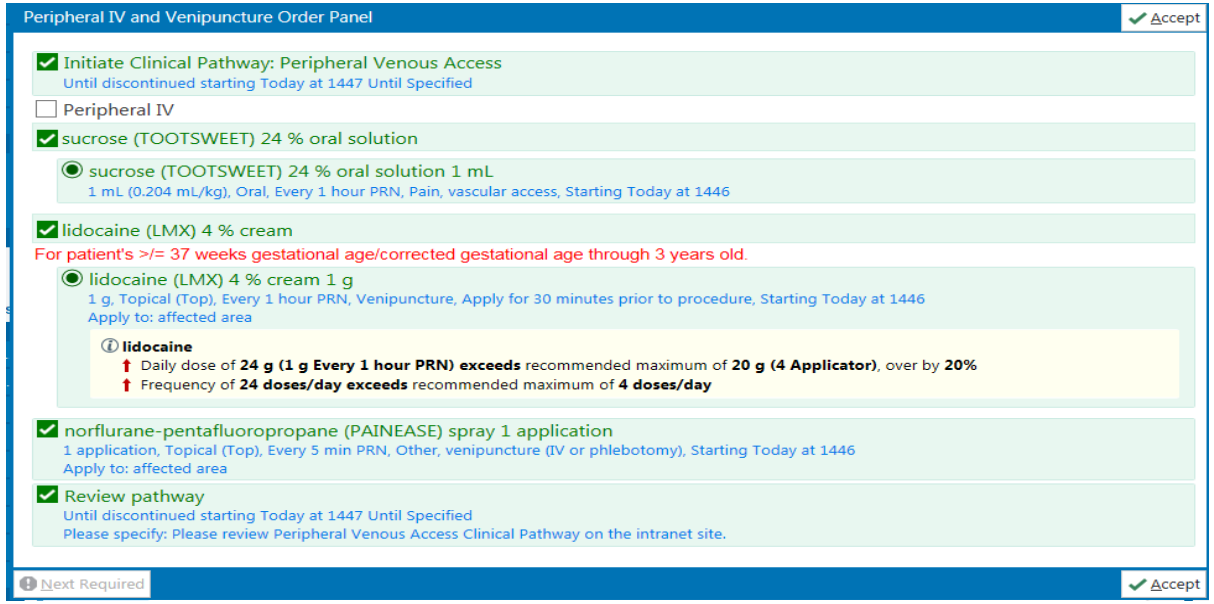
Order Set

- Utilize standing order for topical anesthetics in all admission order sets

Peripheral IV and Venipuncture Order Panel is found under facility list if you type in PIV or venipuncture



- PIV is not pre-checked since this order panel is for venipuncture as well.
- The topical anesthetics that will be pre-selected are age appropriate for that specific patient.
- J-tip order will also be available in this order set



Review of Key Points

Pathway adds:

- Procedure planning with standard use of topical anesthetics and behavioral support
- Stratification of patients with difficult venous access
- Process to utilize unit based resources, when to call alternative unit resources, and who to call
- Limitation in number of attempts at venous access
- Discussion with providers reviewing alternative options if venous access not able to be obtained
- Utilization of Voalte group “IV Team – Difficult Access” to identify additional available skilled team members

Quality Metrics

- Average number of attempts per procedure (per week)
- Number of procedures with a documented attempt in nursing flowsheet
- Number of procedures with 3 or more attempts
- Percentage of patients with documentation of use of topical anesthetics
- Percentage of patients with documentation of use of comfort measures
- Percent utilization of J-tip lidocaine or LMX for IV placement
- Percent utilization of Pain Ease for IV placement
- Percent utilization of sucrose for IV placement
- Percentage of IVs placed for which any topical anesthetic used
  - Total, stratified by inpatient floor, stratified by day/night
- Number of patients/families offered and declined topical anesthetics

Pathway Contacts

- Ilana Waynik, MD
  - Connecticut Children's Pediatric Hospital Medicine
- Stacy Elliot, RN
  - Connecticut Children's Post Anesthesia Care Unit
- Bill Zempsky, MD
  - Connecticut Children's Pain and Palliative Medicine
- Jill Herring, APRN
  - Connecticut Children's Pediatric Hospital Medicine
- Ryan O'Donnell, RN
  - Connecticut Children's Emergency Department

References

- Ali S, McGrath T, Drendel AL. An evidenced-based approach to minimizing acute procedural pain in the emergency department and beyond. Pediatric Emergency Care. 2016;32: 36-45.
- Ammentorp J, Mainz J, Sabroe S. Parents' priorities and satisfaction with acute pediatric care. Arch Pediatr Adolesc Med. 2005;15(2): 127-131.
- Brenner SM, Rupp V, Boucher J, Weaver K, Dusza SW, Bokovoy J. A randomized controlled trial to evaluate topical anesthetic for 15minutes before venipuncture in pediatrics." The American Journal of Emergency Medicine. 2013;31(1): 20-25.
- Cohen LL. Behavioral approaches to anxiety and pain management for pediatric venous access.Pediatrics. 2008;122(3). S134-139.
- Cregin R, Rappaport AS, Montagnino G, Sabogal G, Moreaeu H, Abularrage JJ. Improving pain management for pediatric patients undergoing nonurgent painful procedures." Am J Health-Syst Pharm. 2008;65. 723-727.
- Dalvandi A, Ranjbar H, Hatam M, Rahgoi A, Bernstein C. Comparing the effectiveness of vapocoolant spray and lidocaine/procaine cream in reducing pain for intravenous cannulation: A randomized clinical trial. American Journal of Emergency Medicine. 2017;35(8). 1064-1068.
- Fein JA, Gorelick MH. The decision to use topical anesthetics for intravenous insertion in the pediatric emergency department. Academic Emergency Medicine. 2006;13(3). 264-268.
- Friedrichsdorf et al. Pain outcomes in a US children's hospital: A prospective cross sectional survey. Hospital Pediatrics. 2015;5(1). 18-26.
- Kennedy RM, Luhmann J, Zempsky WT. Clinical implications of unmanaged needle-insertion pain and distress in children.Pediatrics. 2008;122. s130-s133.
- Kleiber C, Sorenson M, Whiteside K, Gronstal BA, Tannous R. Topical anesthetics for intravenous insertion in children: A randomized equivalency study." Pediatrics. 2002;110(4). 758-761.
- Leahy S, Kennedy RM, Hesselgrave J, Gurwitch K, Barkey M, Millar TF. On the front lines: Lessons learned in implementing multidisciplinary peripheral venous access pain- management programs in pediatric hospitals. Pediatrics. 2008; 122(9):s161-s170. doi:10.1542/peds.2008-1055i.
- Postier et al. Pain experience in a US children's hospital: A point prevalence survey undertaken after the implementation of a system-wide protocol to eliminate or decrease pain caused by needles." Hospital Pediatrics. 2018;8(9). 515-523.
- Rauch D, Dowd D, Eldridge D, Mace S, Schears G, Yen K. Peripheral difficult venous access in children. Clinical Pediatrics. 2009; 48(9):895-901. doi:10.1177/0009922809335737.
- Riker M, Kennedy C, Winfrey, BS, Yen K, Dowd MD. Validation and refinement of the difficult intravenous access score: A clinical prediction rule for identifying children with difficult intravenous access. Society for Academic Emergency Medicine. 2011; 18: 1129-1134. doi: 10.1111/j.1553-2712.2011.01205.x.
- Rosenberg RE, Klejmont L, Gallen M, et al. Making comfort count: Using quality improvement to promote pediatric procedural pain management. Hospital Pediatrics. 2016; 6(6). 359-368. doi: 10.1542/hpeds.2015-0240.
- Schecter NL. From the ouchless place to comfort central: The evolution of a concept. Pediatrics. 200;122(3). S154-s160.
- Taddio A, Soin HK, Schuh S, Koren G, Scolnik D. Liposomal lidocaine to improve procedural success rates and reduce procedural pain among children: a randomized, controlled trial. CMAJ. 2005;172(13). 1691-1695.
- Walco GA. Needle pain in children: Contextual factors. Pediatrics. 2008;122(3). s125-s129.
- Yen K, Riegert A, Gorelick MH. Derivation of the DIVA score: A clinical prediction rule for the identification of children with difficult intravenous access. Pediatric Emergency Care. 2008;24(3). 143-147.
- Zempsky, WT. Optimizing the Management of Peripheral Venous Access Pain in Children: Evidence, Impact, and Implementation. Pediatrics. 2008. 122(3). S121-s124. doi:10.1542/peds.2008-1055c.

Thank You!

About Connecticut Children's Clinical Pathways Program

The Clinical Pathways Program at Connecticut Children's aims to improve the quality of care our patients receive, across both ambulatory and acute care settings. We have implemented a standardized process for clinical pathway development and maintenance to ensure meaningful improvements to patient care as well as systematic continual improvement. Development of a clinical pathway includes a multidisciplinary team, which may include doctors, advanced practitioners, nurses, pharmacists, other specialists, and even patients/families. Each clinical pathway has a flow algorithm, an educational module for end-user education, associated order set(s) in the electronic medical record, and quality metrics that are evaluated regularly to measure the pathway's effectiveness. Additionally, clinical pathways are reviewed annually and updated to ensure alignment with the most up to date evidence. These pathways serve as a guide for providers and do not replace clinical judgment.