

NURSING CLINICAL STANDARD

INTRAVENOUS THERAPY

- PURPOSE:** To outline the management of patients receiving intravenous (I.V.) therapy.
- SUPPORTIVE DATA:** I.V. therapy is a pre-licensure skill for RNs. For LVNs with Board-approved I.V. Certification, refer to Nursing Policy Manual for additional information.
- Peripherally inserted midline/midclavicular catheters are *peripheral lines* but are managed (e.g. dressing changes) as central venous catheters (see Central Venous Catheter and Midline Peripheral Venous Catheter Standard).
- Insertion of peripheral IV lines (including saline/heparin locks) requires a provider order.
- After 3 unsuccessful venous attempts or when access is determined to be difficult, when available, contact the vascular access team, refer to Addendum B- Vascular Access Team.
- For pediatric peripheral IV insertion, refer to Intravenous Therapy Standard Addendum A- Pediatric IV Insertion Algorithm.
- ASSESSMENT:**
1. Inspect I.V. bag at onset of shift and with each bag change for:
 - Type of solution
 - Additives
 - Presence of cloudiness/precipitation
 - Label
 2. Check amount of solution in bag at onset and end of shift
 - Leave at least 2 hours of solution in bag for next shift
 3. Inspect tubing every 2 hours (pediatrics/neonatal every 1 hour) for presence of:
 - Air
 - Blood
 - Precipitation
 4. Assess I.V. site location, continuous infusions: every 2 hours (pediatrics/neonatal every 1 hour), saline locks: a minimum of every 8 hours and before and after each use for:
 - Redness, tenderness, swelling
 - Dressing dry and intact
 - Patency
 5. Assess skin integrity to include removal of arm board a minimum of every shift.
 6. Ensure flow rate accuracy every hour (Pediatrics/neonatal).
 7. Total the intake and output every 8 hours.
 - Intake every 1 hour (pediatrics, NICU, ICUs)
- ADMINISTRATION:**
8. Administer I.V. therapy as ordered. Order to include: solution, amount, rate, and additive(s). Note: "To Keep Open" (TKO) orders are not acceptable. Prescriber must specify actual infusion rate. Recommended TKO rates:
 - Minimum for pediatric and adult peripheral lines: 5 mL/hr
 - Minimum for NICU: 1 mL/hr
 - Minimum for adult central lines: 10 mL/hr
 9. Use Alaris™ pump programming for all I.V. fluids and medications.
 10. Administer IV bolus as soon as the order is acknowledged, and complete within 1 hour per liter bag as ordered by one of the following methods:
 - Wide-open
 - Using pressure bag

- Gravity assist
- Via smart pump (rate for IV bolus via pump must be set at 999 mL/hr)
- Rapid infusers when specified per provider order
- Pediatric patient: Attach a stopcock between fluid bag, syringe and IV port extension of IV catheter. Turn stopcock to pull fluid from the bag, then turn stopcock to push into the patient's IV line ("push/pull method")

11. Administer hypertonic solutions (e.g. hypertonic saline, D₅₀W) via a central line except in an emergency.
12. Utilize a buretrol with an infusion pump for all pediatric/neonatal patients weighing less than 12 kg if not utilizing a smart pump.

INFUSION PUMP
OCCLUSION
PRESSURE/
RESISTANCE
MONITORING

13. Ensure maximum occlusion pressure when monitoring on pressure mode. Set as follows: (Pediatrics/NICU)
 - Peripheral: 100 mmHg
 - Central: 300 mmHg
14. Assess pump occlusion pressure reading a minimum of every 4 hours when monitoring on pressure mode (Pediatrics/NICU).

I.V. THERAPY
GUIDELINES:

15. Ensure I.V. order is current.
16. Change I.V. solution every 72 hours or before the "Do Not Start After" date on the label, whichever comes first. (NICU, every 24 hours).
17. Change I.V. tubing as follows:
 - Whenever a new catheter is placed
 - Every 96 hours (4 days)
 - Primary (continuous)
 - Secondary tubing that are connected to primary tubing continuously (per unit protocol)
 - Buretrol
 - Hemodynamic and arterial pressure monitoring units
 - Every 24 hours:
 - Primary used intermittently
 - Secondary (e.g. IVPB unless connected to primary line continuously per unit protocol)
 - Parenteral nutrition (PN)
 - Lipid emulsion
 - NICU: all tubings
 - Special medications/therapies:
 - Chemotherapy/research drugs every dose
 - Blood/blood components every 4 hours or sooner if debris in filter impairs flow
 - Propofol infusion every 12 hours
18. Change peripheral IV catheter every 7 days (except pediatrics/neonatal and midlines) and when clinically indicated (e.g. if there is redness, tenderness, swelling).
 - Catheter may be kept in place longer (with provider's order) if venous access is limited and there is no evidence of phlebitis/infection/infiltration.
 - Discontinue and restart I.V. if signs/symptoms of phlebitis/infection/infiltration develop
 - Change peripheral I.V. catheter/equipment inserted or applied under emergency conditions where breaks in aseptic technique are likely to have occurred, within 24 hours of admission
19. Change alcohol port protector cap whenever tubings are changed, whenever patient is received in a new unit and every time the cap is removed/accessed.
20. Upon patient discharge and per provider order, remove peripheral IV.

LABELING:

21. Ensure IV solution is labeled with:
 - Patient's name
 - MRN
 - Type of solution and additive(s)
 - Date and time hung, and initials of person hanging I.V.
 - The "Do Not Start After" date of 72 hours from when the bag was hung (NICU, every 24 hours)
22. Label insertion site (except NICU) with:
 - Date and time of insertion, and initials
 - Catheter gauge
23. Label I.V. tubing every tubing change with the following:

- Date
- Time
- Initials
- “IV” or name of continuous medication close to insertion site

CARE AND
MAINTENANCE
GUIDELINES:

24. See table for catheter flushing, dressing, reflux valve/cap change and blood withdrawal and catheter change.

25. Follow the I.V. line from the bag/bottle to the patient:

- Whenever a new infusion is started
- At the beginning of the shift

26. Do the following if an infusion is discontinued, but it is anticipated that it may need to be restarted (e.g. vasopressors):

- Keep I.V. tubing connected to the patient
- Turn stopcock (near insertion site) off to the infusion
- Close roller clamp
- Discard medication/fluid and tubing if it has not been restarted within 2 hours

27. Ensure settings on infusion pump used for magnetic resonance imaging (MRI) match Alaris pump settings prior to beginning infusion.

28. Protect I.V. site:

- Use arm board to immobilize I.V. if indicated
- Use immobilizers depending on developmental/mental status

29. Maintain I.V. solution above level of the insertion site.

INFECTION
PREVENTION/
CONTROL

30. Perform hand hygiene immediately before I.V. is accessed.

31. Access I.V. port as infrequently as possible.

32. Utilize needle-less devices or blunt tip needles to access I.V. ports

33. Ensure the following:

- Alcohol port protector cap is placed on all ports
Exception: DO NOT use alcohol port protector cap on lines that have closed system transfer devices attached.
- Alcohol port protector cap is replaced with new cap:
 - Every time the cap is removed (e.g. when accessing the port for administering medications, flushing)
 - When received in a new unit
 - With every tubing change
- Scrub port vigorously:
 - When accessing (e.g. for medication administration, blood draws, tubing changes, and flushes) if the port has not had alcohol cap protector on for at least 1 minute or if unable to use a cap
 - When visibly soiled
 - Between consecutive medication administration

Peripheral lines: Use alcohol

Central lines: Use Chloraprep™ (scrub for 15-30 seconds, allow to dry for 15 seconds)

- Alcohol tip protector is placed on all intermittently used tubing on all lines attached to the patient. Replace with new tip after each use.
- Discard spiked IV solution bag if the infusion is not started within 1 hour

PATIENT/CAREGIVER
EDUCATION:

34. Explain purpose and maintenance of I.V. therapy:

- Importance of not adjusting I.V. rate or resetting alarm
- Maintain extremity in a position that prevents occlusion
- Keep tubing off floor

35. Instruct to report any of the following:

- Redness/swelling/tenderness
- Leaking I.V. site or connections
- I.V. not flowing
- Bag almost empty
- Blood in tubing

ADDITIONAL
STANDARDS:

36. Refer to the following as indicated:

- Blood and Blood Products

- Central Venous Catheter
- Electrolyte Replacement
- Restraints
- Parental Nutrition (PN)
- Intraosseous Device (ICU/ED)

REPORTABLE
CONDITIONS:

37. Notify provider immediately for:
- Signs of site infection/complications
 - Non-patent IV site
 - Infiltration that occurs during infusion of fluids with additives/medications
38. Do the following immediately in a significant event in relation to the pump or medication:
- Discontinue pump from patient, but leave plugged in and turned on
 - Notify Supervisor
 - Complete Safety Intelligence report
 - Send pump to Bio-Med
 - During off-shifts or when Bio Med is not available the charge nurse and Supervisor will sequester the pump in a secure location
 - Place medication and all tubing (clamped) in a sealed bag and hand deliver to pharmacy

PHOTOGRAPHY:

39. Take picture for neonatal/pediatric if:
- An IV infiltrates during the infusion of a medication with high potential for causing tissue damage
 - Persistent redness / swelling / tenderness / blisters develop

DOCUMENTATION

40. Document in accordance with “documentation standards”.
41. Document the following each shift if peripheral I.V. site is not changed every 7 days as recommended (adults only):
- Reason why I.V. site was not changed (e.g. limited I.V. access)
 - Absence of signs of infection
 - Removal of PIV on discharge

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REFERENCES

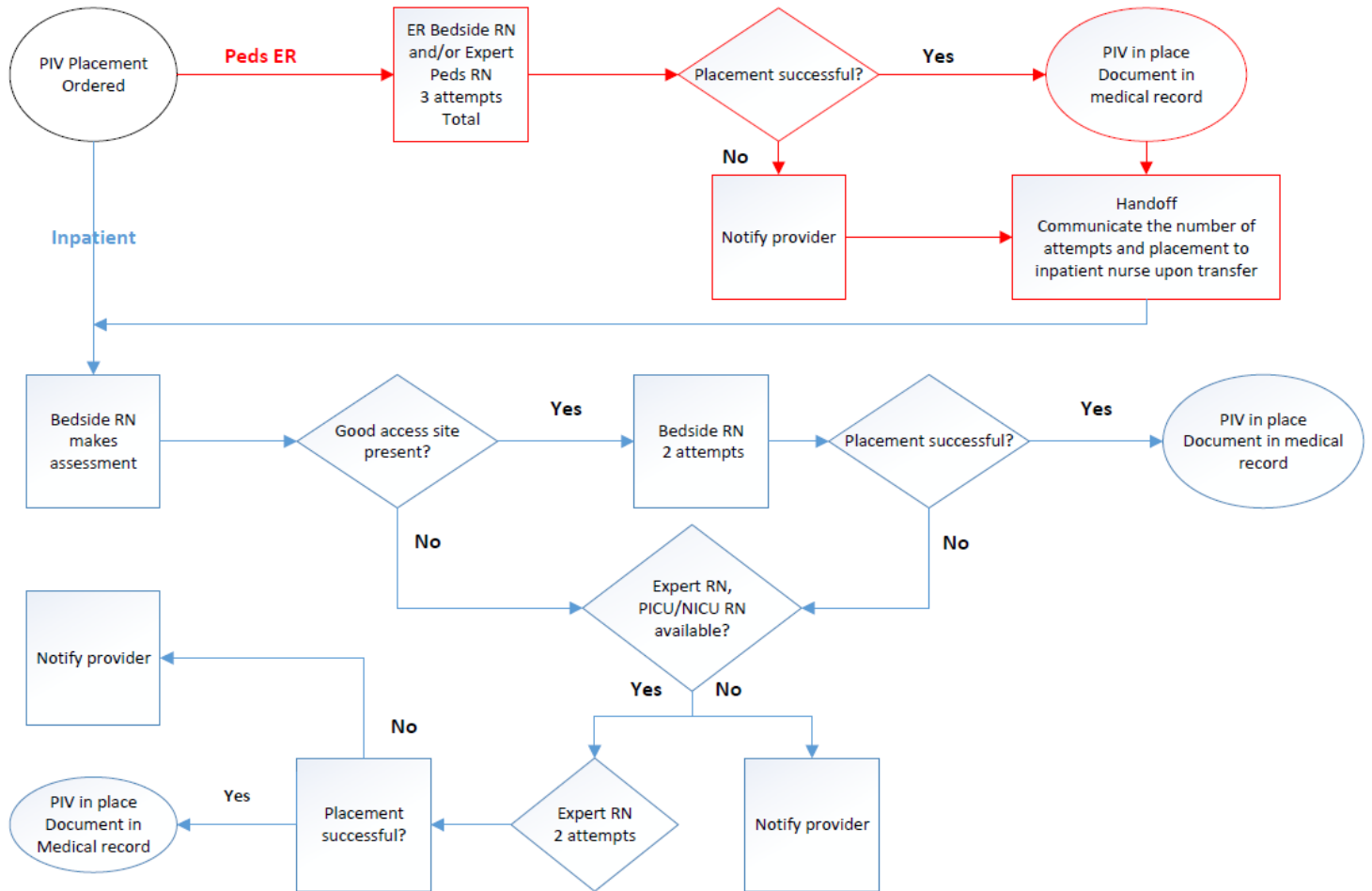
Centers for Disease Control (2017). 2017 Guidelines for the Prevention of Intravascular Catheter-Related Infections. Retrieved from www.CDC.gov

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[JIN-D-15-00057.indd \(yiboshi.com\)](http://JIN-D-15-00057.indd (yiboshi.com))

Consult:
LAC+USC Pharmacy
LAC+USC Department of Epidemiology

Addendum A: Pediatric IV Insertion Algorithm

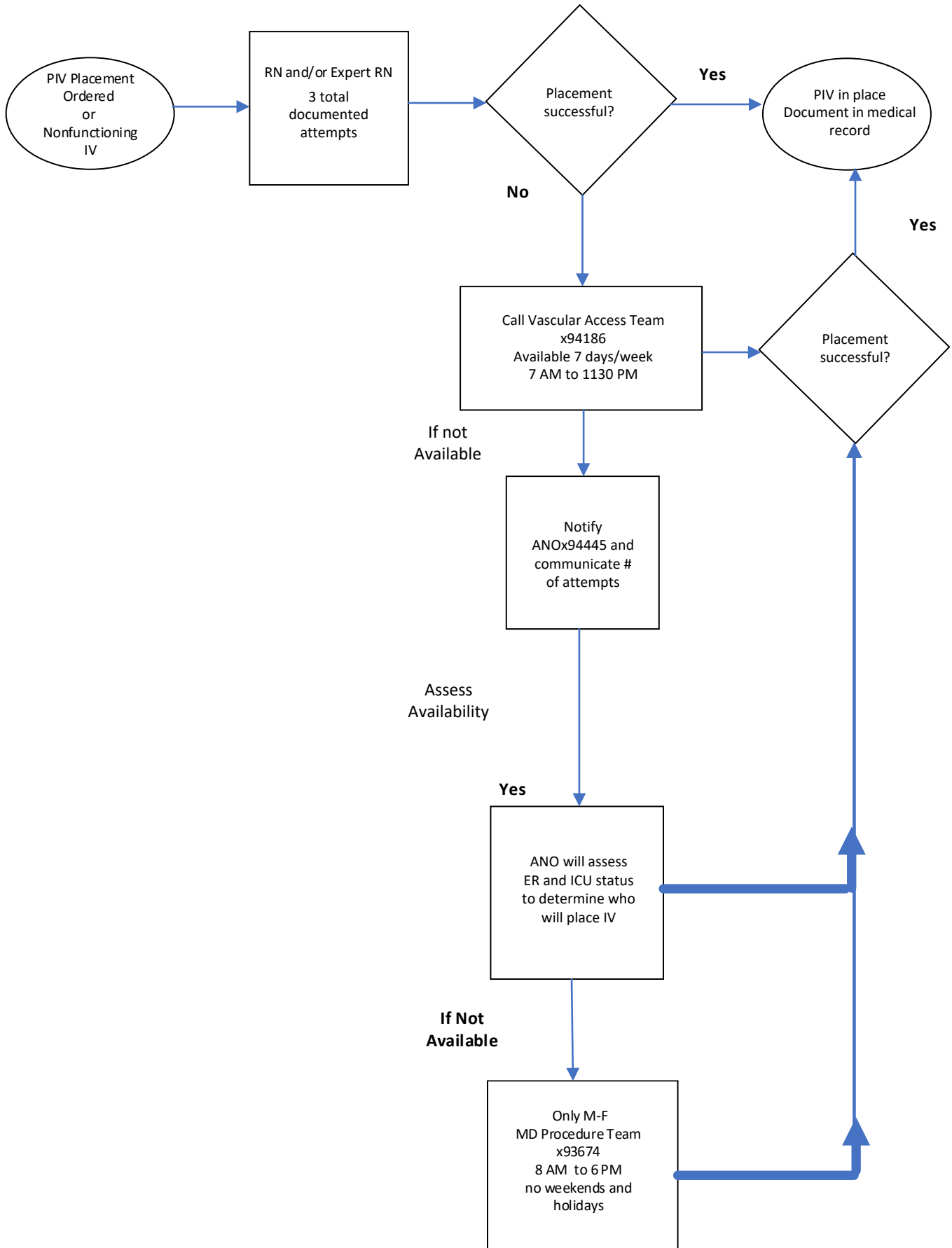
PIV Insertion Algorithm



PERIPHERAL CATHETERS CARE AND MAINTENANCE GUIDELINE

CATHETERS	CATHETER FLUSHING	DRESSING	REFLUX VALVE	BLOOD WITHDRAWAL	CATHETER CHANGE
<p>Peripheral Cannula Example: · Angiocath™ · Insyte autoguard™</p>	<ul style="list-style-type: none"> • When used intermittently, flush with Adults, Pediatrics, Neonatal: SAS S - Saline Adult: 3 ml Pediatric: 1-3 mL Neonatal: 0.5-1 mL A - Antibiotic/I.V. solution (all medications) S - Saline Adult: 3 ml Pediatric 1-3 mL Neonatal: 0.5-1 mL Pediatrics: SASH (use heparin only if ordered by provider): S – Saline 1-3 mL A - Antibiotic/I.V. solution (all medications) S – Saline 1-3 mL H - Heparin 1-3 ml (10 units/ml) • Flush: <ul style="list-style-type: none"> - Every 8 hours - Before and after use - As ordered by provider • Injection ports with continuous infusion: <ul style="list-style-type: none"> - Flush port before and after use with saline, e.g., prior to and post I.V. pushes or IVPB infusions 	<p>CHANGE as follows:</p> <ul style="list-style-type: none"> • Transparent (preferred) - A minimum of every 7 days (Adults only) • Gauze (use if patient is diaphoretic or site is oozing/bleeding)– every 48 hours • When soiled/wet or becomes non-occlusive • Ensure dressing is occlusive • Change armboard when wet or soiled 	<p>CHANGE as follows:</p> <ul style="list-style-type: none"> • Every catheter change • When reflux valve becomes ineffective (e.g., leaking, soiled, cracked, clogged) • Every time it is disconnected from catheter • Coordinate reflux valve/cap change with flush 	<p>Blood withdrawal is greatly discouraged. However, blood can be drawn on new venipuncture <u>PRIOR</u> to attachment of I.V. tubing or saline lock. (Exception Pediatrics/Neonatal: Blood can be withdrawn from peripheral sites if needed.)</p> <p>DO NOT use Vacutainer™ needle or adaptor to withdraw blood from small veins. Use the syringe method.</p>	<ul style="list-style-type: none"> • Change site (including saline locks) every 7 days <p>Catheter may be kept in place longer (with provider’s order) if venous access is limited and there is no evidence of phlebitis/infection</p> <p><u>Pediatric/Neonatal Units:</u> Catheter change will be based on assessment and observation.</p> <p><i>Use Chloraprep™ to disinfect the skin prior to catheter insertion. If the patient is allergic to Chloraprep™ use povidone-iodine.</i></p>

PIV Insertion Algorithm



Addendum B: Vascular Access Team

The Vascular Access Team provides services that include, but are not limited to:

- Insert PICCs and other IV lines at the bedside on selected patients.
- Troubleshoot obstructed central line catheters.
- Provide consultation services to enhance the intravenous skills of the nursing staff through bedside teaching; the VAT can be contacted at any time with vascular access questions.
- Provide education to patients and families about venous access devices.

Goals:

100% Satisfaction: Vascular access services to the medical center, from PICC lines, Midlines, Peripheral IV's and more.

16-Hour/7-day Service (including holidays): 16/7 dispatch service to the various units in the medical center. Available via VOIP.

Consult with ANO for any on-site administrative support.

Consulting: Provide the expertise and to support your clinical staff needs to achieve the best possible patient outcomes.

Request for the following:

PICC lines	Midlines
<ol style="list-style-type: none"> 1. Provider decides the need for PICC line 2. Provider discusses plan of care and purpose of PICC line with patient 3. Provider places CLIP PICC order 4. Provider consents patient 5. Patient signs consent 6. VAT inserts PICC 7. VAT assesses chart/patient. Requests clearance, if any needed. Infectious Disease for antibiotics; Renal patients with CKD; Cardio patients with pacemakers; Nutrition for TPN, etc. 8. VAT notifies (1) Primary team to order x-ray, and places order for clearance to use PICC (2) Primary Nurse to activate care plan 	<ol style="list-style-type: none"> 1. Provider decides the need for Midline. 2. Provider discusses plan of care and purpose of Midline with patient 3. Provider places Midline order 4. VAT assesses chart/patient. Requests clearance, if any needed. Infectious Disease for antibiotics, Renal patients with CKD, Cardio patients with pacemakers, etc. VAT notifies nurse to activate care plan

Peripheral IVs

1. Ensure 3 documented attempts made by Primary Nurse, or when access is determined to be difficult.
 - a. If Primary Nurse unable, then Floor nurse, Preceptor or Charge nurse attempts to start IV
2. If still unsuccessful, call the Venous Access Team at x9-4186
3. Notify ANO 9-4445 and communicate number of attempts. ANO to assess availability with ER and ICU.
4. If staffing/workload does not allow for a Venous Access team member to respond within an hour, the nurses will be directed to contact the MD Procedure Team, at 9-3674, Monday – Friday 8 am to 6 pm (off on weekend/holidays).

Consulting/Assessment of PICC/Midline/PIV

- 24-hour post f/u for PICC and midline
- TPA occluded lines; Discontinue PICC/Midlines
- Extravasation assessment and intervention