IV Therapy, Peripheral: Insertion, Care and Maintenance

Assessment, care and maintenance of any IV catheter (inserted with or without ultrasound guidance)

Please note: This document does not cover IV Catheter INSERTION using ultrasound guidance. For IV catheter insertion using ultrasound guidance, contact your Vascular Access Team. (It is currently under development and specialized training and supplies are required).

Site Applicability

All VCH & PHC sites – acute, community, LTC

Practice Level

Care and Maintenance:

Profession	Setting	Skill Level	Education Requirements
RN, RPN, LPN, Employed student nurse (ESN)	All sites	Basic with additional education	**VCH:** Attendance of Regional Clinical Orientation session on IV Therapy Care & Maintenance **PHC:** Unit-Specific Orientation

Insertion:

Profession	Setting	Skill Level	Education Requirements
RN	All sites	Basic with additional education	• Successful Completion of Online Peripheral IV Insertion Module • Attendance of IV Specific Orientation session as required by work site • Demonstrates competency through a formal process
RPN	All sites with Approval from your local Professional Practice, and Manager		
LPN	**VCH:** With a physician or nurse practitioner order, all sites with Approval from your local Professional Practice and Manager **PHC:** • MSJ site • SPH OPAT		

Quick Links:

Procedures

PART 1: Peripheral IV Catheter (PIV): Insertion

Video: *http://media.healthbc.org/home/iframeflash?url=VCH/Nexiva_MaxZero_20171107*

Policy Statement

1. A prescriber's order is required to initiate and discontinue intravenous (IV) therapy except in an emergency situation as per NIA.
2. Nurses with demonstrated competency in venipuncture, may establish a peripheral IV (PIV) catheter:
   a. in an area of *non-flexion*;
   b. in the *arm* below the antecubital fossa;
   c. 7cm above the wrist on the inner aspect.
3. Nurses, when no other option exists or for diagnostic scanning, may establish an IV catheter in the antecubital fossa.
4. Nurses, when no other option exists, may establish an IV catheter in a foot vein with a prescriber's order.
5. Do not attempt to start a PIV in limbs in the following situations:
   a. operative limb
   b. affected by stroke;
   c. circulatory impairment;
   d. recent, previous fracture;
   e. presence of cast;
   f. PICC insitu;
   g. Mastectomy with removal of axillary lymph nodes
   NOTE: for mastectomy-specific cases, discussion with most-responsible-practitioner (MRP) and/or prescriber must take place with explanation of risks and benefits and best options for patient.
6. For patients identified with chronic kidney disease or acute renal failure requiring AV fistula/graft or with AV fistula / graft insitu, consider vessel preservation strategies as per the BC Provincial Renal Agency Guidelines – refer to Vascular Access Team / IV Resource Team for clinical direction.
7. Only 2 attempts to initiate a PIV catheter can be made by 1 nurse. The Vascular Access Team/IV Team must be called for challenging PIV starts. If no IV Resource is available, another IV certified nurse must be called to initiate the IV. A maximum of four (4) attempts are allowed before MRP must be contacted.
8. Do not insert extra PIV catheters for the purpose of "back-up" access or "just-in-case". PIV catheters should only be inserted when required for planned therapy or diagnostic procedure.
9. Short PIV catheters must not be initiated above the antecubital fossa.
10. PIV catheters may dwell up to 7 to 8 days and must be changed when clinically indicated (i.e. swelling, redness, tenderness, or drainage).
11. Specific IV catheter gauge sizes can be used for power injection – refer to product instructions for use (confirm maximum mL/sec for catheter size). See Appendix C for Nexiva™ Diffusics catheter ratings for power injection).
12. Student Nurses will not perform venipuncture.
13. Patients receiving IV therapy in outpatient or community settings can be discharged home with PIVs insitu for the duration of their treatment.
14. Ensure plan of care in place for care and maintenance of device
15. The insertion and use of PIVs will not be restricted in inpatient and outpatient/community settings. Harm reduction principles and complication prevention strategies will be considered to ensure patients and families have full access to health care services in all circumstances including the presence or use of injected substances. Refer to specific health authority policies and guidelines:
    PHC: Philosophy or Care for Patients and Residents Who Use Substances
    VCH: Harm Reduction Practice

PHC/VCH: Supporting choices through informed decision-making and collaboration

Need to Know

1. Avoid areas of flexion and location of nerves - remove the needle/catheter immediately if patient complains of pain associated with the catheter as this may indicate a nerve is being irritated or touched.
2. Avoid areas where arteries are located - remember that arteries will pulsate on palpation. If accidental puncture of an artery occurs, remove the needle / catheter immediately and apply pressure on the puncture site for **5 to 10 minutes** until all bleeding has stopped. ***Do not apply tourniquet above puncture (injured) artery***.
3. PIV sites must be covered with a sterile adhesive transparent dressing to allow for easy visualization of the IV site. This must be changed (and skin antisepsis with CHG performed) if soiled, loose or after 7 to 8 days.
4. PIV catheters come in a variety of color coded gauge sizes. Selection is based on the therapy ordered (see Appendix A).
5. All PIV catheters will be accessed through the needleless connector (NC) at the end of the integrated tubing. If an integrated tubing system is not used, an extension set will be added to the catheter hub.
6. **Medical Imaging Department - Implications:**
   a. PIV catheter insertion is required for administration of contrast media, radiopharmaceuticals, IV fluids and medications in the Medical Imaging Department.
   b. Preferred catheter size is #20 gauge but #22 gauge is acceptable. Ensure that the catheter size is appropriate for the vein selected for insertion. Refer to manufacturer recommendations for maximum flow rate capabilities for each catheter size – See Appendix C for Nexiva™ and Diffusics™ Power Injection Rates.
   c. If veins in the antecubital fossa are accessed, ensure that the arm is kept straight during IV contrast administration to minimize the risk of extravasation.

Insertion of PIV Catheter: Procedure

Equipment & Supplies:

- Non-sterile gloves
- Alcohol swabs - large
- Peripheral IV start kit, or:
  - Tourniquet (non-latex, single use)
  - Sterile, transparent adhesive dressing
  - Skin antiseptic: Chlorhexidine swab (CHG 2% + Alcohol 70%)
  - 2 x 2 gauze
  - Tape
- Clippers or scissors (NOT razor)
- Pre-filled 5 or 10 mL NS syringes
- IV catheter – appropriate size
- Extension set with attached needleless connector (NC) in sterile package - *if required
- Needleless connector (NC) – stand alone for Nexiva™ Diffusics™ (SPH)

Procedure:

1. Check prescriber's orders, confirm patient identification and explain the procedure to the patient.
2. Wash hands. Gather equipment and supplies.
3. Clean work surface with surface disinfectant and let dry.
4. Perform hand hygiene using soap and water or alcohol based hand rub (ABHR) before preparing equipment.
5. Select appropriate vein. Clip hair if required. Do not use razor to shave.

6. Apply tourniquet. Don non-sterile gloves.
   a. Cleanse site with 2 wipes. First, use an alcohol wipe to 'empty and fill' the vessel and promote dilation of the vein.
   b. Next, use chlorhexidine 2% with alcohol wipe. Cleanse the intended puncture site using friction for combined 30 seconds and over an area larger than the intended dressing. Allow to dry completely, (approximately 30 seconds).
7. Open sterile packages while keeping items sterile within packages.
8. Establish 2-point anchor of the vein.
9. Refer to specific IV catheter type / brand for insertion technique:
   a. Appendix C: BD Medical – Nexiva™ / Diffusics™
   b. Appendix D: Smiths Medical – ProtectIV Plus™ / Via Valve™
10. Remove tourniquet.
11. Apply sterile transparent dressing over puncture site and hub of IV.
12. Flush PIV with NS. Then remove syringe and discard. Always clamp extension tubing as close to the IV site as possible.
13. Discard covered sharp/needle into sharps container.
14. Secure extension tubing to skin with tape to prevent kinking.
15. Record date and inserter initials on tape strip and apply to transparent dressing.
16. Instruct the patient to report any signs of pain, redness, swelling or leaking at the site.
17. Document procedure.

PART 2: PIV Site Assessment, Care & Maintenance, and Infusion

Policy Statement

1. PIV catheters and insertion sites which are saline locked must be assessed for complications and patency at minimum every shift (inpatients) or daily (outpatients/community) and more frequently if clinically indicated.
2. PIV catheters accessed for IV continuous infusion will be assessed every 1 to 2 hours.
3. PIV catheters must be removed:
   a. Within 24 hours if inserted in an emergency situation (i.e. paramedic, trauma bay, code blue)
   b. Within 24 hours if placed in an area of flexion or compromise (i.e. ACF, foot/leg)
   c. Within 7 to 8 days or when clinically indicated (i.e. swelling, redness, tenderness, or purulent drainage)
   d. At completion of therapy or when no longer clinically indicated
4. Aseptic technique is maintained throughout all PIV catheter use, care and maintenance.
5. 70% isopropyl alcohol pads are used to disinfect the NC before each entry; the NC is scrubbed for 15 seconds and allowed to dry **completely** (minimum 30 seconds).
6. IV tubing must be changed each time the PIV catheter is changed, and according to tubing guidelines.

Need to Know

1. Pulsatile, push-pause flush technique required to prevent the back-flow of blood into the tip of the catheter and to maintain catheter patency.
2. Saline locks must be flushed with **at least** 3 mL of normal saline (NS) following each use of the lock or once every shift if IV medications have not been administered. It is appropriate to use a 5 or 10 mL pre-filled syringe with NS.
3. Use of appropriate flushing and clamping technique is required to prevent the back-flow of blood into the tip of the catheter and to maintain catheter patency. Proper procedure is to flush, then remove the syringe from the NC, then CLAMP.
4. Refer to Elsevier's Clinical Skills online for removing a PIV catheter.

5. To keep-vein-open (TKVO) rates for PIV infusion – unless otherwise ordered by physician:
   a. Gravity – 50 mL/hr
   b. Pump – 25 mL/hr
6. A **midline catheter** is also classified as a peripheral IV – all care and maintenance and removal for midline catheters can be done by a general unit nurse.
   PHC: Refer to Midline Catheters (Peripheral), Patient Care (B-00-13-10020).

A. Routine Assessment

Assess the PIV site and document on the flowsheet every shift and in the patient's chart if warranted:

- Continuous/Intermittent infusion: Assess 1 to 2 hourly and more frequently if indicated
- Saline lock: Assess every shift (minimum every 12 hours for inpatient) and more frequently if clinically indicated
- Flush and lock with the clamp each time the device is accessed.

Assess	IV Site Assessment
Site	Skin and site are pain free with no swelling or discharge, no signs of infiltration or extravasation, the limb is warm.
Dressing	Dry, intact, secure, free from blistering or local skin tearing.
Local Infection	No signs of infection or hard cord palpable. No redness, edema or heat at site or extending up arm. No pain.
Patent Infusion or Lock	Running well, not occluded, pump not alarming, no blood back up into extension set, easy to flush.

- If the site assessment reveals the presence of phlebitis, see Appendix F – Phlebitis and notify the physician immediately for treatment if indicated.
- If the site assessment reveals that the PIV catheter is interstitial it must be removed immediately. If there is significant peripheral edema, also assess the limb and fingers for signs of circulatory/neurological deficits locally. Notify the physician immediately for treatment. See Appendix E – Complications.
- If a vesicant medication has extravasated (interstitial vesicant medication), treatment should be determined prior to PIV catheter removal. When the catheter is removed, excessive pressure should be avoided while achieving hemostasis. Notify the physician immediately for treatment.

  VCH PHC:
  - Extravasation Management (Non-Antineoplastic Vesicant/ Irritant Medications) - Adults [BD-00-13-40101]

  VCH:
  - Parenteral Drug Therapy Manual (PDTM)

  PHC:
  - Extravasation Vesicant (Suspected) [B-00-12-10111]
  - Extravasation Vesicant: Protocol for Managing Suspected [B-00-13-10138]

B. Tubing Change and Solution Checking

- All IV tubing must be labeled with date and time it is initiated.
- Check expiry dates of all tubing, medications and solutions before use.
- Check all tubing for defects and solutions for precipitates before using them.
- If contamination of the IV / tubing / line occurs - ensure it is changed immediately.

- All IV tubing used for intermittent infusions must be covered with sterile cap (e.g. red dead-ender) between uses.
- The bottle/bag or auxiliary IV unit must be labeled clearly with the following information:
  - Name of medication
  - Patient's name and identification number
  - Date and time the medication was added
  - Concentration or dose of medication added
  - Initials of the nurse adding the medication

Frequency of Tubing Change:

Item	Frequency
1st access after insertion	New tubing
Continuous infusion Add-on sets: i.e. extension sets and "Y" connectors	Every 96 hours
Intermittent infusion	Every 24 hours
Secondary medication tubing	When the primary tubing is changed
Blood and blood product infusion:	**VCH:** D-00-07-30101 **PHC:** B-00-12-10065

Frequency of IV Bag Change:

Item	Frequency
Non-Medicated IV bag	With tubing (continuous or intermittent)
Medicated IV bag (Manufacturer prepared)	Intermittent – with tubing. Continuous: When empty or with tubing change every 96 hours (whichever comes first).
Medicated IV bag (pharmacy or RN added)	Intermittent – with tubing. Continuous: Check drug stability with pharmacy otherwise when empty or with tubing change every 96 hours (whichever comes first).

C. Saline Lock Maintenance

Equipment & Supplies:

- Alcohol swabs
- 3 to 10mL syringe pre-filled with 0.9% normal saline (NS)
- Non-sterile gloves

Procedure:

1. Check prescriber's orders, confirm patient identification and explain the procedure to the patient.
2. Wash hands. Gather equipment and supplies.
3. Clean work surface with surface disinfectant and let dry.
4. Perform hand hygiene using soap and water or alcohol based hand rub (ABHR) before preparing equipment.
5. Put on non-sterile gloves.
6. Scrub top of needleless connector (NC) with an alcohol swab using friction for 15 seconds. **ALLOW TO DRY COMPLETELY (minimum 30 seconds)**.
7. Attach pre-filled NS syringe to the NC and inject 3 to 10 mL NS solution using pulsatile, push-pause technique. Flush until visibly clear. Do not bottom out the syringe.
8. If resistance is felt, assess for mechanical obstruction. Do not force flush.
9. Remove syringe and discard.
10. Clamp extension tubing immediately as close to the IV site as possible.
11. Wipe top of NC with an alcohol swab to remove fluid residue.
12. Document procedure.

D. Converting a Saline Lock to a Continuous IV

Equipment & Supplies:

- Alcohol swabs
- 3 to 10mL syringe pre-filled with NS
- Non-sterile gloves
- IV tubing and solution
- IV pump

Procedure:

1. Check prescriber's orders, confirm patient identification and explain the procedure to the patient.
2. Gather equipment and supplies.
3. Perform hand hygiene using soap and water or ABHR before assembling equipment.
4. Prime IV tubing maintaining sterility and check solution for precipitates and leaking.
5. Put on non-sterile gloves.
6. Assess the PIV site before commencing.
7. Open clamp.
8. Scrub needleless connector (NC) with an alcohol swab for 15 seconds. **ALLOW TO DRY COMPLETELY (minimum 30 seconds)**.
9. Attach the pre-filled saline syringe onto the cap maintaining aseptic technique.
10. Flush using pulsatile, push-pause technique to ensure thorough flushing of extension tubing and NC.
11. If resistance is felt, do not force flush.
12. Depress the plunger, leaving the last 0.2 to 0.5 mL of saline in the syringe.
13. Remove syringe and discard.
14. Scrub the top of the NC with an alcohol swab for 15 seconds. **ALLOW TO DRY COMPLETELY, (minimum 30 seconds)**.
15. Connect IV tubing to the NC.
16. Initiate IV continuous infusion via pump.
    VCH Only: In extenuating circumstances only may infusion be run by gravity, see Infusion Pump Guideline.
17. Check for signs of infiltration.
18. Secure tubing.
19. Document procedure.

If Infusion rate for PIV therapy is controlled by gravity you must calculate drops per minute:

$$\frac{\text{Infusion Rate} \times \text{tubing drop factor}}{\text{Administration time (minutes)}} = \text{drops per minute}$$

E. Converting an Infusion to a Saline Lock

Equipment & Supplies:

- Alcohol swabs
- 3 to 10 mL syringe pre-filled with NS
- Non-sterile gloves
- Sterile, red dead-ender cap

Procedure:

1. Check prescriber's orders, confirm patient identification and explain the procedure to the patient.
2. Wash hands. Gather equipment and supplies.
3. Perform hand hygiene using soap and water or ABHR before preparing equipment.
4. Assess the PIV site before commencing.
5. Stop IV infusion.
6. Put on non-sterile gloves.
7. Disconnect IV tubing from Needleless Connector (NC).
8. Cap tubing with sterile cap (e.g. red dead-ender), if IV tubing will be re-connected for later infusion.
9. Scrub NC with an alcohol swab for 15 seconds. **ALLOW TO DRY COMPLETELY, minimum 30 seconds**.
10. Attach the pre-filled NS syringe onto the NC maintaining aseptic technique.
11. Flush using pulsatile, push-pause technique to ensure thorough flushing of extension tubing and NC.
12. If resistance is felt, do not force flush.
13. Depress the plunger, leaving the last 0.2 to 0.5 mL of NS in the syringe.
14. Remove syringe and discard.
15. Wipe top of NC with an alcohol swab to remove fluid residue.
16. Close the clamp immediately.
17. Document procedure.

F. Removal of a Peripheral IV

Refer to Clinical Skills (Elsevier): Intravenous Therapy: Discontinuation

To best view this document, please copy and paste link into Google Chrome:

VCH:

1. First open Elsevier Clinical Skills: https://epm601.elsevierperformancemanager.com/Personalization/Home?virtualname=VancouverCoastalHealth
2. Then Copy and Paste skills link: http://mns.elsevierperformancemanager.com/SkillsConnect/Default.aspx?Token=549253&SkillID=396

PHC:

1. First open Elsevier Clinical Skills: https://login.mns.elsevierperformancemanager.com/Login.aspx?virtualname=providencehealthcare-canada
2. Then search for Intravenous Therapy: Discontinuation.

If an IV catheter is not removed completely, refer to PCG I-240 IV Therapy: Removing a non-intact IV Catheter (catheter embolus) (VA Specific).

Part 3: Appendices

- Appendix A: IV Catheter Gauge Size Recommendations
- Appendix B: IV Catheter Types in VCH/PHC
- Appendix C: IV Catheter Insertion – BD Medical (Nexiva™ / Diffusics™)
- Appendix D: IV Catheter Insertion – Smiths Medical (ProtectIV Plus™ / Via Valve™)
- Appendix E: Complications
- Appendix F: Phlebitis – Information and Phlebitis Scale

Expected Patient/Client/Resident Outcomes

No complications related to peripheral IV therapy.

Patient/Client/Resident Education

Teach patient and/or family to recognize the signs of possible complications of intravenous therapy and when to alert staff (e.g. signs of infection or pain).

Documentation

Document all assessments and interventions on site specific forms and flowsheets.

References

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Alexander, M., Corrigan, A., Gorski, L., Hankins, J., & Perucca, R. (Eds.). (2010). Infusion nursing: An evidence-cased approach (3rd ed.). St. Louis, MO: Saunders/Elsevier.

Infusion Nurses Society (INS). (2016). Infusion therapy standards of practice. Journal of Infusion Nursing, 39 (1Supplement), S1-159.

Infusion Nurses Society (INS). (2016). Policies and procedures for infusion therapy (5th ed.). Norwood, MA: Author.

O'Grady, N.P., Alexander, M., Burns, L.A., Dellinger, E.P., Garland, J., Heard, S.O., & Healthcare Infection Control Practices Advisory Committee. (2011). Guidelines for the prevention of intravascular catheter-related infections. American Journal of Infection Control, 39(4 Supplement 1), S1-S34. Doi: 10.1016/j.ajic.2011.01.003.

Phillips, L.D. & Gorski, L. (2014). Manual of I.V. therapeutics: Evidence-based practice for infusion therapy (6th ed.). Philadelphia, PA: F.A. Davis CO.

Revised by

[September 2021] Regional Vascular Access Educator/Clinician Group.

Patients receiving IV therapy in outpatient or community settings can be discharged home with PIVs insitu for the duration of their treatment, harm reduction principles added

[November 2018]

VCH RPNs and LPNs added as approved by SPRRC (Scope of Practice & Regulations Review Committee)

[May 2018]

Developer Lead(s):

Clinical Educator, VGH Vascular Access Team, Vancouver Acute
Nurse Educator IV Therapy, home infusion programs, OPAT, Providence Health Care
Clinical Nurse Educator, Vascular Access Team, LGH & Sea to Sky Corridor, Coastal

Other members:

Clinical Educators, VGH Vascular Access Team
Clinical Resource Nurse, Infusion Program, Richmond Hospital
Clinical Educator, IV Program, Vancouver Community

Endorsed by

VCH: *(Regional SharePoint 2nd Reading)*

Health Authority Profession Specific Advisory Council Chairs (HAPSAC)
Health Authority & Area Specific Interprofessional Advisory Council Chairs (HAIAC)
Operations Directors
Professional Practice Directors

PHC: Professional Practice Standards Committee

Final Sign-off & Approval for Posting by

Vice President Professional Practice and Chief Clinical Information Officer, VCH

Date of Approval/Review/Revision

Approved: May 11, 2018
Posted: May 11, 2018
Revised: Nov 14, 2018

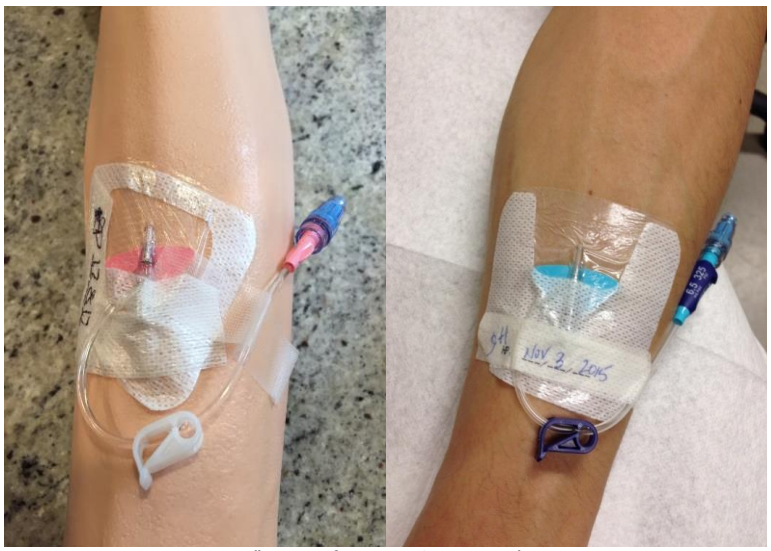
Appendix A: IV Catheter Gauge Size Recommendation

IV catheter gauge selection must be based on a critical analysis of the clinical needs of the patient or a specific order. Choose the smallest catheter size that meets the clinical need and place in the largest straight and palpable vein available.

Catheter Gauge Size	Colour of Catheter Hub	Indication for Use
14	Orange	• Emergency situations • Introducer for larger catheter insertion
16	Grey	• Emergency situations • Introducer for larger catheter insertion
18	Green	• General use, most therapies • Interventional radiology procedures • In the operating room
20	Pink	• General use, most therapies • Interventional radiology procedures • In the operating room
22	Blue	• General use, most therapies • If unable to insert larger catheter
24	Yellow	• General use, most therapies • If unable to insert larger catheter

Appendix B: IV Catheter Types in VCH/PHC

BD Medical – Nexiva™ / Diffusics™



(images from: PHC IV Team)

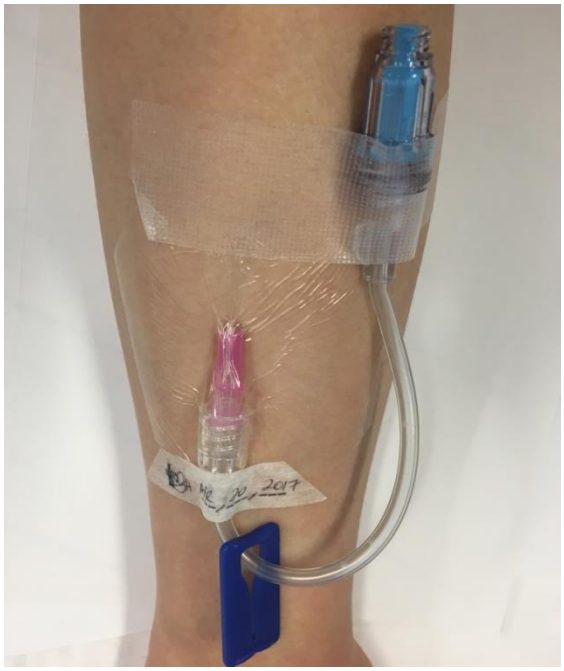
(image from: BD.com with permission)

Smiths Medical – ProtectIV Plus™ and ViaValve™

(image from: PHC IV Team)

(image from: Smiths-Medical.com with permission)

BBraun – Introcan™



(image from: PHC IV Team)

(image from: BBraun.com with permission)

Appendix C: Nexiva™ IV Catheter Insertion

(images from: BD Medical & VGH VAT)

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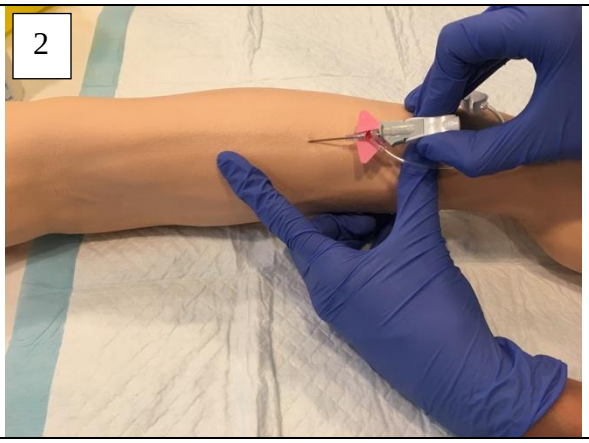
<td> 
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Secure the vent plug
Clamp should not be engaged
Twist to remove needle cover
Holding as shown, pull back approx. 1/8 inch on finger grips (fig. 1)
Push finger grips back to their original position so the gray push-tab piece and the white finger grips are snugly together

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Access the vessel (fig. 2)
Initial blood return is along the catheter, then up the extension tube

NOTE: Once you see blood return, lower the insertion angle and advance the entire catheter and needle unit slightly to ensure the catheter and not just the needle tip is within the vessel
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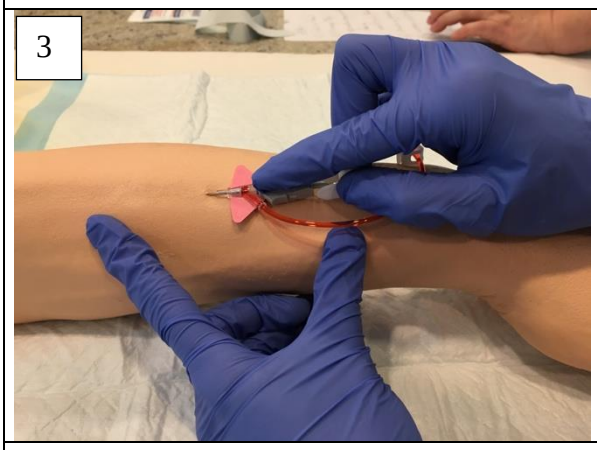
<td> 
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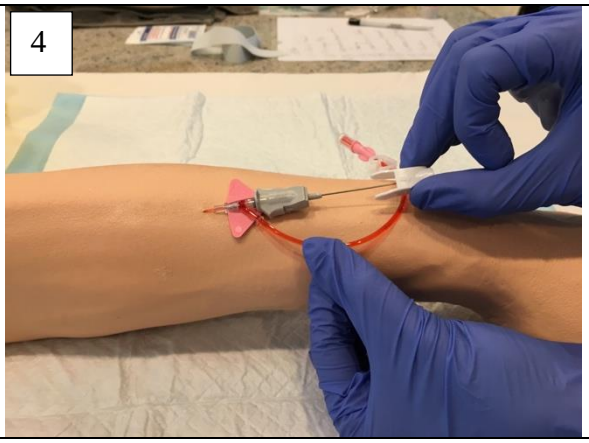
<td> 
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While stabilizing the vessel, put the pad of your index finger behind the gray push tab and advance the catheter forward while holding the white finger grips stationary

NOTE: Blood return will advance up the extension tubing as the needle is being removed out of the catheter.
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While stabilizing the platform, pull back on the white finger grip until the gray tab releases from the stabilization platform (fig. 4)

TIP: Do not hold the gray component of the device as this will prevent the release of the shielded needle.
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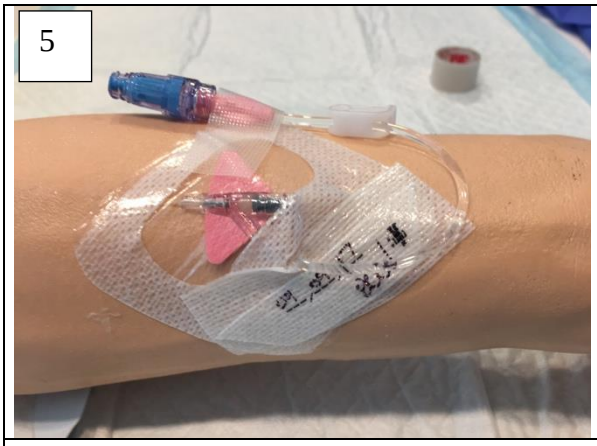
5 	
• Apply a transparent dressing to cover the entire insertion site and catheter platform. Ensure that the catheter insertion site is visible (fig. 5) • Engage the clamp • Remove the vent plug • Attach a pre-primed needleless connector, flush the system, and re-engage the clamp	

Nexiva Diffusics™ IV Catheter – Information for CT procedure and power injection

POWER INJECTION GUIDELINES

18-24 gauge catheter systems are suitable for use with contrast media up to 27.5 cP viscosity, with power injectors set to a maximum pressure of 325 psi, and within maximum flow rate.

The catheter system is tested for integrity and ***stability*** at the listed flow rates, however, this does not imply appropriateness of the procedure for a particular patient. Evaluation of the health status of a patient prior to a power injection procedure should be performed by a suitably qualified clinician.

Due to variations in add-on devices, tubing, contrast media temperature and pressure limit settings, these flow rates may not be achievable.

Power Injection Flow Rates

Gauge and Length	BD Catalog #	Max Flow Rate (mL/sec)	Max Injector Setting (PSI)
24 G 0.75 IN	383590	3.0	325
22 G 1.00 IN	383591	6.5	325
20 G 1.00 IN	383592	10.0	325
20 G 1.25 IN	383593	10.0	325
18 G 1.25 IN	383594	15.0	325

Non Diffusics

BD Nexiva™ Closed IV Catheter System—Single Port

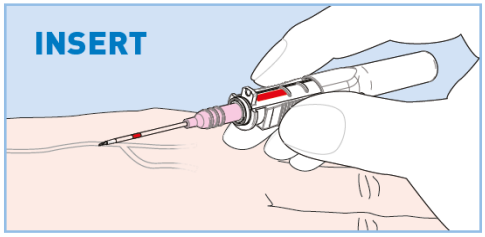
REFERENCE NUMBER	COLOUR CODE	GAUGE SIZE	CATHETER LENGTH (in)	CATHETER O.D. (mm)*	CATHETER I.D. (mm)*	EXTENSION TUBE I.D. (mm)	UNITS BOX/CASE	FLOW RATE H_2O (mL/hr)
383510	Yellow	24	0.56	0.71	0.53	1.22	20/80	960
383511	Yellow	24	0.75	0.71	0.53	1.22	20/80	900
383512	Blue	22	1.00	0.90	0.67	1.22	20/80	1800
383516	Pink	20	1.00	1.10	0.83	1.65	20/80	3240
383517	Pink	20	1.25	1.10	0.83	1.65	20/80	3120
383518	Pink	20	1.75	1.10	0.83	1.65	20/80	2880
383519	Green	18	1.25	1.31	0.98	1.65	20/80	4860
383520	Green	18	1.75	1.31	0.98	1.65	20/80	4560

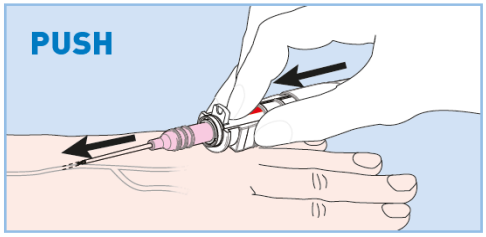
For power injection use, refer to Instructions For Use.
*Average dimensions.

(images from: BD.com)

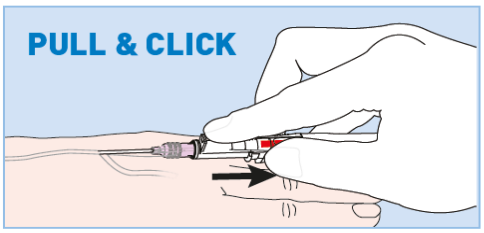
Appendix D: ProtectIV Plus™ and ViaValve™ Catheter Insertion

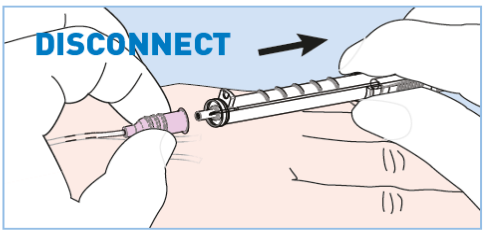
(images from: Smiths-Medical.com with permission)





- Apply tourniquet and prepare site according to policy.
- Hold catheter by ribbed needle housing with thumb and fingers to insert needle into skin.
- Visually inspect to confirm that needle bevel and push-off tab are facing up.
- Anchor vein with gentle skin traction.
- Insert needle at appropriate angle.
- Observe for flashback.
- If needed, slightly advance catheter and needle together to achieve full catheter entry into vein lumen.
- Place index finger behind the primary push-off tab and **PUSH** catheter to thread to desired length.
- **DO NOT REINSERT NEEDLE INTO CATHETER AT ANY TIME.**





- Stabilize device at push-off tab with index finger.
- Holding ribbed needle housing, **PULL** needle into needle guard until you hear a **CLICK.**
- **THE CLICK AND VISUAL INSPECTION INDICATE THAT SAFETY DEVICE HAS ENGAGED SUCCESSFULLY.**
- Remove tourniquet.
- Apply digital pressure as needed beyond catheter tip.
- Hold catheter hub and needle housing.
- Disconnect needle housing by pulling backwards with a slight upward motion.
- Connect Luer lock or tubing to hub per manufacturer's recommendation.
- Secure connection with firm push and twist.
- Stabilize and dress according to policy.

Appendix E: Potential Complications

Complication	Signs/Symptoms	Interventions
Phlebitis (Refer to Appendix F for Phlebitis Rating Scale)	• Redness, streaking of vein. • Inflammation around insertions site or surrounding area. • Ache, pain or tenderness along any portion of the catheter and vein.	• Remove PIV catheter. • Replace PIV catheter if necessary–use new, alternate site for insertion. • Apply warm compresses to site.
Infection	• Local: phlebitis (see above) plus purulent drainage at insertion site. • Systemic: all of the above plus fever, chills, increased white blood cell (WBC) count.	• Remove PIV catheter. • Notify MRP. • Culture swab of insertion site. • Assess site regularly. • Ensure dressing is dry and intact; ensure all IV connections are intact. • Monitor vital signs. • Treat fever. • Apply warm compresses to site.
Thrombosis Formation of a blood clot within a blood vessel	• Redness at site. • Tenderness and edema of arm. • Pain. • Inability to aspirate blood and/or infuse through PIV. • Possible discolouration of the arm.	• Remove PIV catheter. • Notify MRP. • Replace PIV if necessary – use new, alternate site for insertion.
Catheter Occlusion Can occur from a clot formation inside the catheter lumen	• Inability to aspirate and/or infuse through PIV.	• Remove catheter. • Replace PIV if necessary – use new, alternate site for insertion.
Infiltration An inadvertent administration of a **nonvesicant** solution or medication into surrounding tissue	• Pain (e.g. burning, stinging). • Swelling from infusate in subcutaneous tissue. • Changes in color (e.g. blanching, redness).	• Stop infusion. • Aspirate for blood return. • DO NOT FLUSH. • Do not apply pressure to the area. • Notify Vascular Access Team/IV Team and MRP for appropriate clinical management.
Extravasation Inadvertent infiltration of **vesicant** solution or medication into surrounding tissue	• Pain (i.e. burning, stinging). • Swelling from infusate in subcutaneous tissue. • Changes in color (i.e. blanching, redness). • Blister formation (within hours).	• Stop infusion. • Aspirate for blood return. • DO NOT FLUSH. • Do not apply pressure to the area. • Notify Vascular Access Team/IV Team and MRP for appropriate clinical management. • Photograph site. • If vesicant medication has extravasated, see: **VCH PHC:** ○ Extravasation Management (Non-Antineoplastic Vesicant/ Irritant Medications) - Adults [BD-00-13-40101] **VCH:** ○ Parenteral Drug Therapy Manual (PDTM) **PHC:** ○ Extravasation Vesicant (Suspected) [B-00-12-10111] ○ Extravasation Vesicant: Protocol for Managing Suspected [B-00-13-10138]

Complication	Signs/Symptoms	Interventions
Air Embolism	• Sudden onset of shortness of breath. • Chest pain. • Hemoptysis, cough. • Cyanotic lips and nails.	• If patient exhibits ACUTE signs/symptoms: clamp catheter, turn patient to lie on LEFT side, obtain vital signs, administer oxygen PRN, stay with patient, notify MRP STAT.
Circulatory Overload	• Hypertension. • Hypotension. • Tachycardia. • Edema. • Shortness of breath. • Desaturation.	• Notify MRP. • Stop infusion. • Place patient in high Fowler's. • Administer oxygen if ordered and required.
Arterial Injury / Accidental Puncture	• Pain at insertion site. • Unable to thread catheter. • Bright red blood. • Pulsating blood.	• Remove catheter / needle immediately. • Apply pressure to site for 5 to 10 minutes until bleeding has stopped. • **Do NOT apply a tourniquet above the injured artery. • Notify MRP.

Appendix F: Phlebitis Assessment and Intervention Chart, Prevention of Device Specific Catheter Insertion

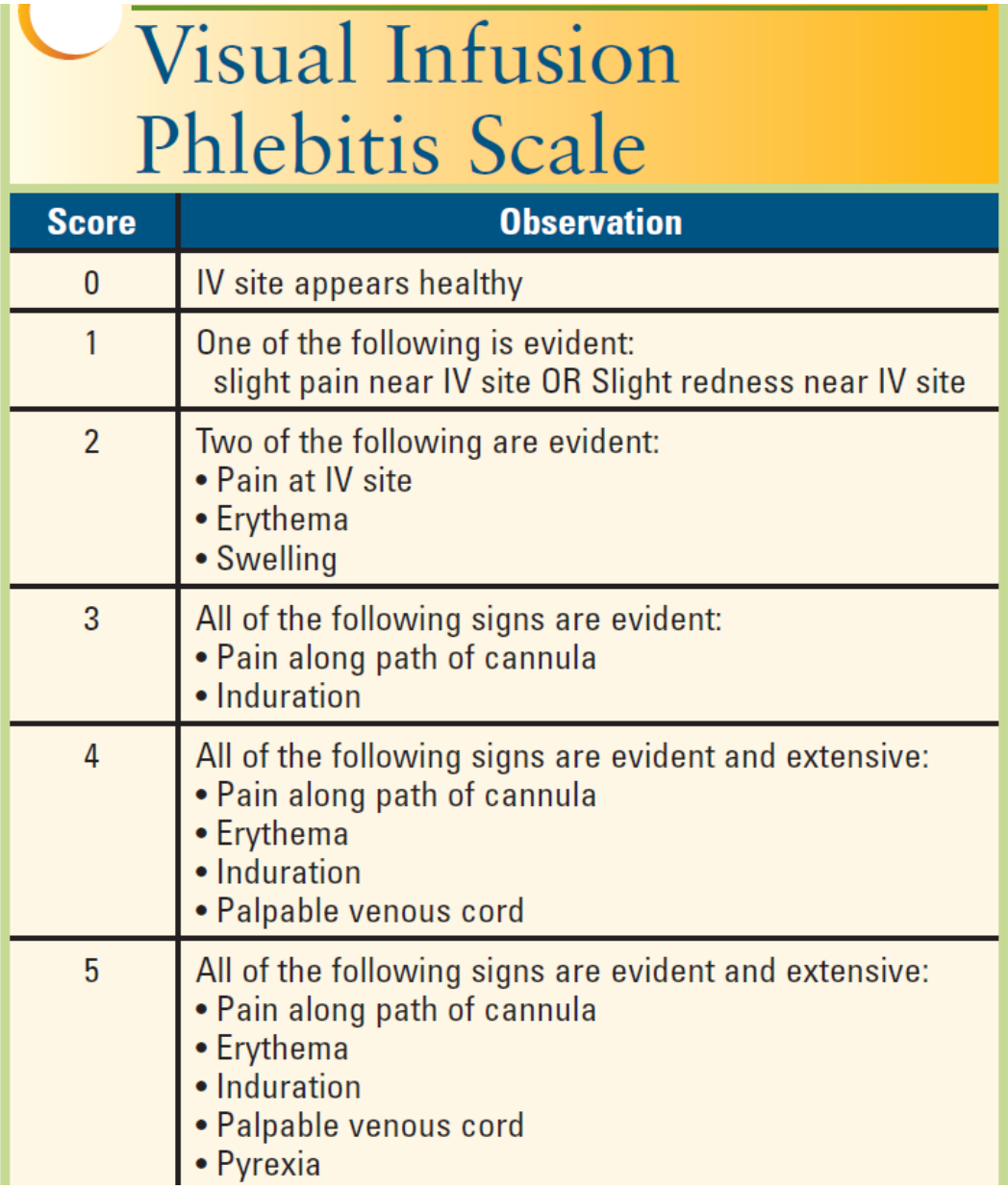
Infusing intravenous catheters will be assessed a minimum of every two hours and discontinued **immediately** if tenderness, swelling or redness is observed.

- PIV catheters may be placed in areas of flexion **in emergencies** or when **no other option** is available, and then it will be removed in 24 hours.
- Tenderness is the **first sign** and stage of phlebitis. This will *progress rapidly* to include redness and swelling. Tenderness requires **removal of the IV catheter.**
- Avoid the use of foot veins, or when no other option is available contact the IV resource nurse.
- A hot towel in a clear plastic bag will be used as a "HOT PACK". Avoid the use of heated IV bags, heating pads or hot water bottles.
- Secure appropriately to avoid catheter moving in and out of the vein.

Prevention of Phlebitis:

- **Mechanical** phlebitis:
  - Avoid insertion in areas of flexion.
  - Secure appropriately to avoid catheter moving in and out of the vein.
  - Insert smallest gauge catheter for the required treatment.
- **Chemical** phlebitis:
  - Request the patient be assessed for placement of a Peripherally Inserted Central Catheter (PICC) if IV therapy is extending past six days and the treatment requires the administration of irritating solutions.
  - Administer push medications through a port of a compatible free-flowing IV.
  - Administer medications or solutions at the minimal rate recommended.
  - Rotate IV sites every 7 to 8 days and when clinically indicated, before the development of phlebitis.
- **Bacterial** phlebitis:
  - Use aseptic technique when manipulating or using the venous system.
  - Secure appropriately to avoid catheter moving in and out of the vein.
  - Rotate PIV sites every 7 to 8 days and when clinically indicated, before the development of phlebitis.
- **Thrombosed** Vein:
  - Assess the causative factors when the infusion runs slowly, rule out mechanical problems.
  - In the absence of mechanical problems consider a narrowing of the vein lumen, which allows less fluid to be infused and discontinue the IV immediately.
  - Consider a thrombus if the extremity is swollen below the IV catheter insertion site.
  - Thrombi form a "trap" for bacteria and require reporting to the physician, the site will be assessed to evaluate the need for surgical intervention.

Phlebitis Scale



Visual Infusion Phlebitis Scale

Score	Observation
0	IV site appears healthy
1	One of the following is evident: slight pain near IV site OR Slight redness near IV site
2	Two of the following are evident: • Pain at IV site • Erythema • Swelling
3	All of the following signs are evident: • Pain along path of cannula • Induration
4	All of the following signs are evident and extensive: • Pain along path of cannula • Erythema • Induration • Palpable venous cord
5	All of the following signs are evident and extensive: • Pain along path of cannula • Erythema • Induration • Palpable venous cord • Pyrexia

(From: Infusion Nurses Society (INS). (2016). Infusion therapy standards of practice. Journal of Infusion Nursing, 39 (1Supplement), page: S96).