



Drawing Coagulation Studies from Heparinized Central Lines

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Abstract

A literature review was conducted between the months of September and December 2017 to determine whether using heparinized central lines to draw coagulation studies is best evidence based practice. The purpose was to research the efficacy of using a heparinized central line to draw coagulation studies. This research is for the Abben Cancer Center affiliated with Spencer Hospital in Spencer, Iowa. Ten articles focusing on patients with heparinized lines or discard volume were reviewed. Results showed that heparin primarily has an effect on Activated Partial Thromboplastin Time (aPTT). It was found that using heparinized central lines to draw blood studies could have a positive impact on patient anxiety and comfort levels.

Purpose and Significance

- Determine evidence for using heparinized central lines to draw coagulation studies for accuracy and influence of the heparin.
- Comprehensive literature review conducted from September of 2017-December of 2017
- Keywords: heparinized lines, venous access, aPTT, coagulation studies, blood tests, central line, heparinized, coagulation, and blood draw
- 6 articles in CINAHL, 1 in PubMed, and 3 in Google.
- 10 articles total met criteria: blood draws from central ports or peripheral lines, coagulation studies, and affect of heparin on those studies
- Criteria for discarding articles: did not pertain to heparinized lines, central lines, discard volumes, did not include heparin, only focused on coagulation or central ports but not both, or focused on general blood labs and not specifically coagulation labs

Defining the Study

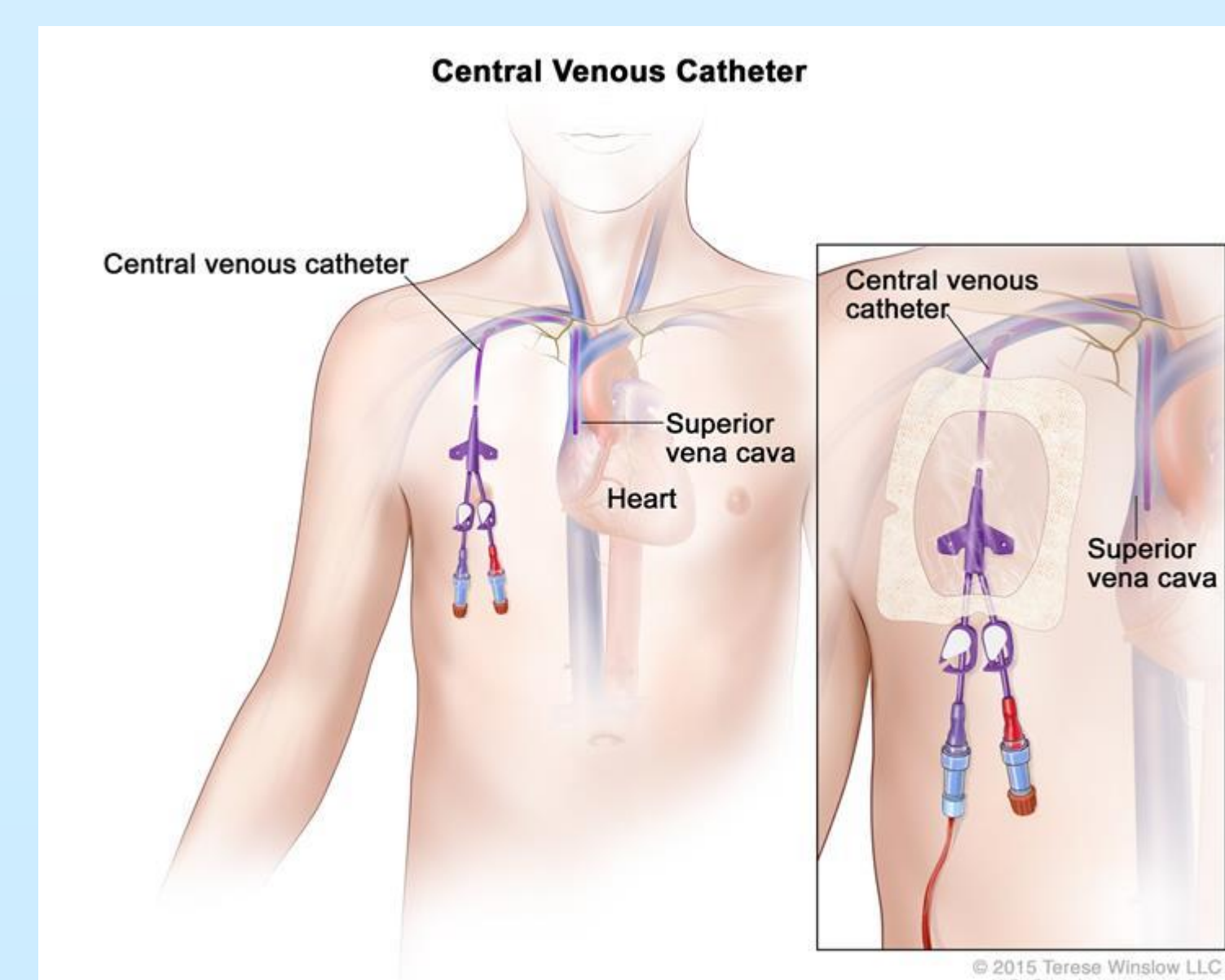
- **aPTT:** The time needed for plasma to form a fibrin clot following the addition of calcium and a phospholipid reagent; used to evaluate the intrinsic clotting system
- **Central Venous Catheters:** A catheter that is threaded through the internal jugular, antecubital, or subclavian vein, usually with the tip resting in the superior vena cava or the right atrium of the heart. It is also used to administer fluids or medications for hemodynamic monitoring and to measure central venous pressure.
- **Discard Volume:** The amount of blood withdrawn before the actual blood specimen is withdrawn
- **Heparin:** A pharmaceutical that prolongs the clotting time of blood
- **Heparinized:** To perform therapeutic administration of heparin



<https://www.indiamart.com/proddetail/triple-lumen-central-venous-catheter-seldinger-technique-15476437073.html>

Methods

- Johns Hopkins Appraisal method used to review level and quality of evidence (Dearholt, S., Dang, D., Sigma Theta Tau International, & Institute for Johns Hopkins Nursing, 2012).



<https://www.cancer.gov/publications/dictionaries/cancer-terms/def/central-venous-access-catheter>

Results

- Drawing blood from a heparinized line has minimal or no effect on PT, INR, or FBG.
- Acceptable to draw coagulation samples from heparinized lines if PT, INR, or FBG are being analyzed
- Heparinized lines affect aPTT values.
- Use venipuncture to obtain aPTT values
- If trying to draw aPTT value from heparinized, a discard volume needs to be wasted first to obtain accurate values
- Research was inconclusive on how to calculate what the discard volume should be.

Recommendations

1. Continue using venipuncture for aPTT
 2. Evidence suggests venipuncture remains the most accurate method (Hinds et al., 2002; Prue-Owens, 2006; Richiuso, 1998; Templin et al., 1983)
- Develop protocol for drawing other coagulation studies from the heparinized central line that includes discard volume criteria (Mayo et al., 1996)
 - Having one method of calculating discard volume will ensure accuracy of coagulation studies
 - Discard volume should start at the amount of dead space in the apparatus multiplied by two (Prue-Owens, 2006)

1. Verify order from doctor or nurse practitioner.
 2. Gather necessary supplies.
 3. Identify patient.
 4. Explain procedure to patient.
 5. Wash hands, don gloves.
 6. Stop any IV infusions.
 7. Disconnect IV tubing from access port and place a nonvented cap at the end of the tubing.
 8. Allow one minute to pass prior to withdrawing any blood.
 9. Place sterile 4 x 4 under sampling port.
 10. Cleanse access port with alcohol swab for 10 wipes or 3 seconds (whichever occurs first).
 11. Attach syringe to reflux valve.
 12. Aspirate two times the volume of the dead space to discard as waste. If the line is heparinized and coagulation studies are required, draw six times the dead space.
 13. Remove discard syringe from lumen.
 14. Attach vacutainer to lumen.
 15. Obtain blood specimens via vacutainer.
 16. Remove vacutainer.
 17. Flush line with 10 cc NS.
 18. Reattach any IV fluids that had been infusing prior to blood sampling.
 19. Dispose of vacutainer and waste syringe in appropriate receptacles.
 20. Label tubes with patient name and medical record number after identifying patient using two identifiers.
 21. Place specimens in specimen bag and send to laboratory via pneumatic tube system.
- NS—normal saline

Figure 2. Dead Space Method

Conclusion

- In summary, heparinized central lines can be used to draw coagulation labs when aPTT values are not being tested.
- If the health care provider needs aPTT values for a patient's plan of care, then a venipuncture would be required to yield accurate results (Hinds et al., 2002; Prue-Owens, 2006; Richiuso, 1998; Templin et al., 1983).
- When drawing blood from a heparinized central line, it is necessary to first discard blood based on a standard equation that each health-care facility needs to develop and implement (Lin et al., 2009; Mendez, 2012; Mayo et al., 1996; Pinto, 1994; Prue-Owens, 2006; Richiuso, 1998; Templin et al., 1983; Wyant & Crickman, 2012).
- Using heparinized lines for drawing coagulation studies can increase overall patient comfort and satisfaction of care (Templin, 1993)

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