

THINK PERIPHERAL ACCESS FIRST

Advancing peripheral access for apheresis with ultrasound

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BACKGROUND:

The apheresis clinic at the Aarhus University Hospital performs **over 1,200 procedures annually for adults and children**, mostly on an outpatient basis. Common procedures include therapeutic plasma exchange, extracorporeal photopheresis (ECP), stem cell harvest for donors and patients, and lymphocyte collections.

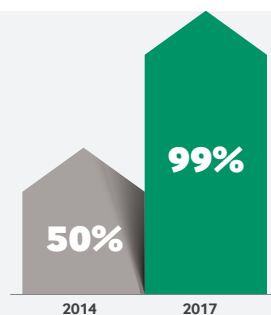
In 2014, the clinic determined that central venous catheters (CVCs) did not flow properly for its ECP patients; this served as the catalyst for implementation of ultrasound-guided venous access.

IMPLEMENTATION:

To implement the program, the clinic:

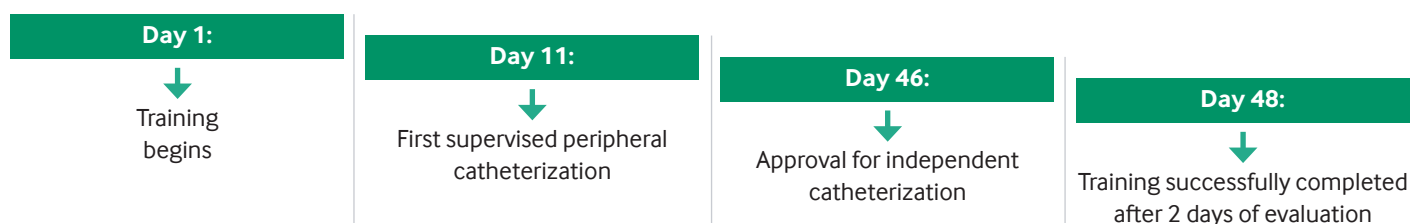
- 1 Explored funding options early
- 2 Met with staff to gain initial support before implementation
- 3 Developed training with hands-on tools and buddy system
- 4 Planned ample time for implementation, practice and training
- 5 Trained dynamic needle-tip positioning (DNTP) approach

Increased peripheral access from 50% to 99% through the implementation of an ultrasound-guided cannulation technique.



TRAINING:

Within 6 months of initiating the training program, all selected apheresis nurses were approved for independent ultrasound-guided peripheral access catheterizations. Systematic training took place to ensure regular daily clinical work was not impacted.



CONCLUSION:

The Aarhus team credits the following for maintaining an ongoing successful program:

- Encourage nurses to take the time they need
- Ensure that a supervisor is always present
- Update standard operating procedures to include ultrasound with guidance for these aspects:
 - Vein selection
 - Access optimization
 - Cannula size selection
 - Cannula removal



If you choose ultrasound as a guide for peripheral access, you should be very dedicated. It needs dedication and time to start, but it will pay off very shortly.

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Apheresis-Related Safety Information

Contraindications:

Leukocytapheresis is contraindicated in acute myeloid leukemia FAB M3 (acute promyelocytic leukemia) because of the accompanying disseminated intravascular coagulation.^{1,2}

Other contraindications for the use of the Spectra Optia system are limited to those associated with the infusion of solutions and replacement fluids as required by the apheresis procedure and those associated with all types of automated apheresis systems.

Adverse events of apheresis procedures can include:

Anxiety, headache, light-headedness, digital and/or facial paresthesia, fever, chills, hematoma, hyperventilation, nausea and vomiting, syncope (fainting), urticaria, hypotension, allergic reactions, infection, hemolysis, thrombosis in patient and device, hypocalcemia, hypokalemia, thrombocytopenia, hypoalbuminemia, anemia, coagulopathy, fatigue, hypomagnesemia, hypogammaglobulinemia, adverse tissue reaction, device failure/disposable set failure, air embolism, blood

loss/anemia, electrical shock, fluid imbalance and inadequate separation of blood components.

Reactions to blood products transfused during procedures can include:

Hemolytic transfusion reaction, immune-mediated platelet destruction, fever, allergic reactions, anaphylaxis, transfusion-related acute lung injury (TRALI), alloimmunization, posttransfusion purpura (PTP), transfusion-associated graft-versus-host disease (TA-GVHD), circulatory overload, hypothermia, metabolic complications and transmission of infectious diseases and bacteria.^{3,4}

Restricted to prescription use only.

- Operators must be familiar with the system's operating instructions.
- Procedures must be performed by qualified medical personnel.

References

¹Vahdat L, Maslak P, Miller WH Jr, et al. Early mortality and the retinoic acid syndrome in acute promyelocytic leukemia: impact of leukocytosis, low-dose chemotherapy, PMN/RAR-alpha isoform and CD13 expression in patients treated with all-trans retinoic acid. *Blood*. 1994;84(11):3843-3849.

²Daver N, Kantarjian H, Marcucci G, et al. Clinical characteristics and outcomes in patients with acute promyelocytic leukaemia and hyperleucocytosis. *Br J Haematol*. 2015;168(5):646-653.

³AABB. *Circular of Information for the Use of Human Blood and Blood Components*. Bethesda, MD: AABB; 2017.

⁴European Directorate for the Quality of Medicines & HealthCare (EDQM). *Guide to the Preparation, Use and Quality Assurance of Blood Components*. 19th edition. Strasbourg, France: EDQM Council of Europe; 2017.

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A Successful Model to Learn and Implement Ultrasound-Guided Venous Catheterization in Apheresis*

For more details on the ultrasound-guided venous access training program that Aarhus University Hospital implemented and to request a copy of the article, please contact Anna-Marie Thomsen at annathom@rm.dk.

*Gopalasingam N, Thomsen AME, Folkerson L, Juhl-Olsen P, Sloth E. A successful model to learn and implement ultrasound-guided venous catheterization in apheresis. *J Clin Apher*. 2017;32(6):437-443.



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