

Apheresis predictive algorithm quick guide

SUCCESSFUL ENGRAFTMENT OUTCOMES ARE DIRECTLY CORRELATED WITH THE PRECISE CD34+ DOSE INFUSED.¹

A predictive algorithm is a reliable method to predict the volume of whole blood needed to process based on a donor’s pre-apheresis CD34+ count and the transplant center’s target product CD34+. Predictive algorithms can help ensure you collect an effective dose for patients while optimizing the donor’s experience by avoiding additional processing time connected to the apheresis machine.

This predictive algorithm estimates the number of liters of whole blood to process in order to achieve an optimal collection outcome.^{2,3}

Collection target CD34+ cells *[in CD34+ cells]*

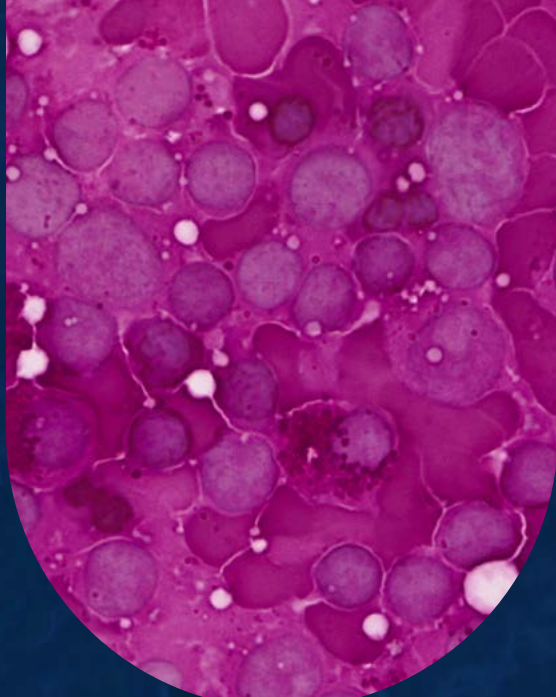
$$\begin{array}{c}
 \text{CD34+ collection efficiency*} \\
 \textit{[in decimal number]}
 \end{array}
 \times
 \begin{array}{c}
 \text{Donor pre-apheresis CD34+ measurement} \\
 \textit{[in CD34+ cells per liter]}
 \end{array}
 =
 \begin{array}{c}
 \text{Whole blood to process} \\
 \textit{[in liters]}
 \end{array}$$

*NMDPSM recommends a presumed CD34+ collection efficiency of 40%

EXAMPLE:

- Collection target CD34+ cells: **536**
- Collection efficiency: **40%**
- Donor pre-apheresis CD34+: **63**

$$\frac{536}{0.40} \times 63 = 21.3 \text{ liters whole blood to process}$$



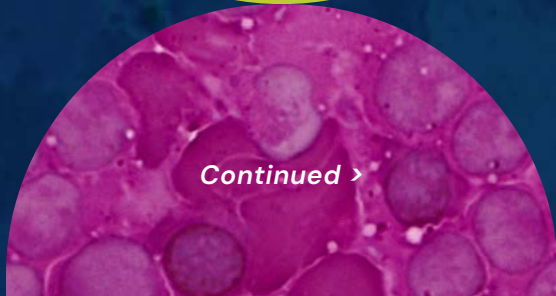
Key contacts at NMDP



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Using your apheresis center's specific collection efficiency versus the NMDP Network average collection efficiency may impact overall the outcome of the collection.

- If your center uses a higher collection efficiency rate, your center may decide to process additional liters or percentage above the initial calculation to ensure product quality and cell counts to meet the transplant center's request.
- Collection efficiency can differ due to machine, operator and donor variabilities.

REMINDERS

- NMDP's PBSC Protocol limits the number of liters processed to a maximum of 30 liters total over one or two days; exceeding 30 liters must be preapproved by NMDP.
- Contact NMDP Transplant Medical Services if you are concerned the transplant center's target CD34+ count will not be met.
- Use the NMDP Day of Collection Notification (FRM-00367) form whenever possible.

QUESTIONS?

Review the [Day of Collection Activities section](#) of our Apheresis and Collection Center Training. Access the training via the Collections resources and education section of network.nmdp.org.

KEY CONTACTS AT NMDP

For day of collection questions, contact Transplant Medical Services: tms@nmdp.org

For questions outside the day of collection, contact Partner Liaisons: partnerliaisons@nmdp.org

REFERENCES

1. Pulsipher MA, Chitphakdithai P, Logan BR, et al. Donor, recipient, and transplant characteristics as risk factors after unrelated donor PBSC transplantation: beneficial effects of higher CD34+ cell dose. *Blood*. 2009;114(13):2606-16. doi: 10.1182/blood-2009-03-208355
2. Miller A, Davies J, Young K, et al. The effect of increased collect pump rate on collection efficiency in hematopoietic progenitor cell collection by apheresis in allogeneic adult donors—A single center analysis. *Transfusion*. 2023;63(10):1926-1936. doi: 10.1111/trf.17533
3. Godbey E, Dormesy S, Gowda L, et al. A dual strategy to optimize hematopoietic progenitor cell collections: validation of a simple prediction algorithm and use of collect flow rates guided by mononuclear cell count. *Transfusion*. 2019;59(2):659-670. doi: 10.1111/trf.15034