Beaumont Laboratory
Royal Oak

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Related Documents: P228, P407A

PLATELET STORAGE

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Purpose

The purpose of this document is to provide policies relating to the storage of platelets.

Introduction

Platelet must be stored between 20ºC - 24ºC. Storage of platelets above 24°C may result in undesirable metabolic changes. Platelet storage below 20°C, even for brief periods, may cause irreversible declines in platelet function. In addition, agitation during storage is necessary to ensure optimal gas exchange and maintenance of pH. Plastics currently approved and commonly used for platelet unit storage permit adequate gas exchange to maintain pH of at least 6.2 at the end of the platelet's shelf life.

Platelets at this facility are stored in an incubator that maintains a temperature of 20ºC - 24ºC and continuously agitates the platelets. The policies in this document help ensure that platelets are maintained at these required conditions to maximize platelet function.

Policies

Platelet Receipt

- Platelets are processed into inventory as soon as possible after they are received.
- All non-pathogen reduced platelets are then irradiated at this facility, if not already irradiated by the blood supplier.
- The platelets are documented on the dry erase board at the triage area. This includes the ABO/Rh, expiration date, any special attributes, and the name of the patient for whom they are reserved (if applicable).
- The platelets are stored in the platelet incubator, with the label facing down to expose as much of the surface area as possible. Platelets are not stacked on top of each other.

Platelet Count

As provided by the blood supplier, platelet concentrates are required to have a minimum of 5.5×10^{10} platelets/unit and apheresis platelets are to have 3×10^{11} platelets/unit in at least 95% of units tested. Low yield apheresis platelets with a platelet count of 2.6×10^{11} to 2.9×10^{11} may arrive from the blood supplier. There are no restrictions as to who can or cannot receive a low yield platelet. Any platelet pheresis component from which an aliquot has been removed at this facility should have a remaining platelet count of at least 3×10^{11} in order to release the remainder of the component to inventory or to transfuse to another patient without MD approval; for additional information refer to P407A, *Disposition of Components from which an Aliquot has been Removed.*

Platelet Bags / Expiration Dates

- All platelets at this facility have a maximum ~~5~~ 7-day expiration date.

- When preparing a syringe or aliquot of platelets and when pooling platelet concentrates, the expiration date is changed considering whether an open or closed system was used for preparation, as described throughout the applicable Standard Operating Procedures (SOPs).

Bacterial Contamination

This facility uses the ~~Pan Genera Detection (PGD)~~ PGDprime® test to detect bacterial contamination of random donor platelet concentrates or platelets pooled at this facility. For additional information refer to P228, *Bacterial Testing of Platelets by the ~~Pan Genera Detection~~ PGDprime® Test.*

Consultation with the Blood Bank Medical Director (MD) / Variances

In all cases where the technologist questions whether a platelet is suitable for transfusion, the platelet should be quarantined, and a variance should be submitted and the Medical Director must be consulted before the platelets may be transfused. The technologist does not need to consult the MD if he or she determines that the platelets should be discarded, but a variance should be submitted. Refer also to *Evaluation of Platelet Suitability for Transfusion based on Swirling, Temperature, and Time.*

Platelet Swirling

In some cases, the Blood Bank may have concerns that storage or transport conditions could result in irreversible declines in platelet function. The observation that a platelet is swirling is an indicator that an irreversible decline in platelet function has not occurred. Examination for swirling is accomplished by gently rotating or tapping a platelet bag in front of a light source. Functioning platelets have a discoid morphology, which allows them to align with flow and give the appearance of a wave or swirl.

It may be necessary to let the platelets agitate on the platelet rotator for approximately 60 minutes for swirling to become evident; e.g., platelets that have not been agitating after they were issued or during extended transport. If it is necessary, let the platelets agitate for up to 60 minutes on the shelf of the platelet rotator that is labeled for this purpose.

Platelets shall be examined for swirling in the following situations:

- Prior to issuing a platelet for transfusion.
- If a platelet has been returned from issue status.
- Prior to transferring a platelet to another facility.
- Upon receipt of a platelet from an outside facility.
- In all cases where the technologist questions whether a platelet is suitable for transfusion, for any reason.

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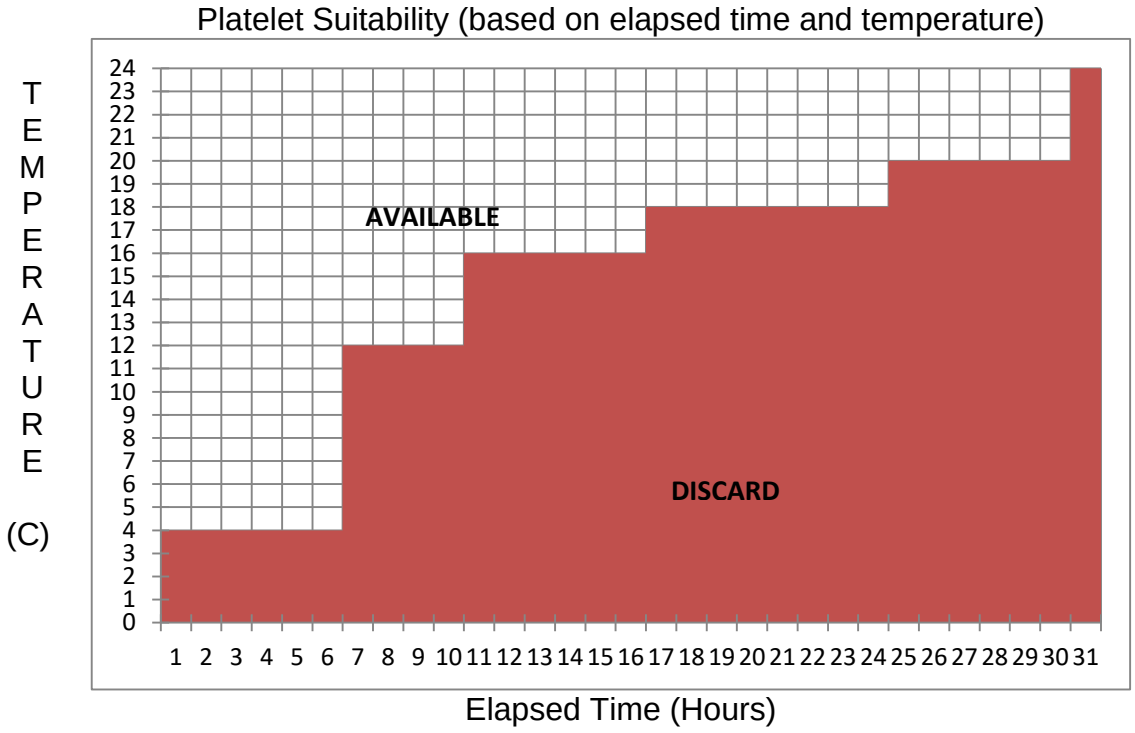
Evaluation of Platelet Suitability for Transfusion based on Swirling, Temperature, and Time

Temperature	Elapsed Time (Issue to Return)	Swirling	Appropriate Status
Any temperature	More than 30 hours	Yes	Discard
24°C – 26 °C	30 hours or less	Yes	Quarantine
20°C to 24 ~~26~~°C	30 hours or less	Yes	Available
More than 18°C; less than 20°C	24 hours or more	Yes	Discard
	Less than 24 hours	Yes	Available
18°C or less	24 hours or more	Yes	Discard
More than 16°C; less than18°C	16 hours or more	Yes	Discard
	Less than 16 hours	Yes	Available
16°C or less	16 hours or more	Yes	Discard
More than 12°C; less than 16°C	10 hours or more	Yes	Discard
	Less than 10 hours	Yes	Available
12°C or less	10 hours or more	Yes	Discard
More than 4°C; less than 12°C	6 hours or more	Yes	Discard
	Less than 6 hours	Yes	Available
4°C or less	Any amount of time	Yes	Discard



Platelets Returned from Issue / Appropriate Actions

- The temperature of all blood products shall be taken upon return from issue and documented on the pink copy of the crossmatch tag. The temperature of platelets should be between 20ºC - 24ºC.
- Any platelet that is returned more than 30 hours after it was issued shall be discarded.
- Any platelet that is returned from issue with a temperature of 4°C or less shall be discarded.
- A platelet must be checked for swirling upon return from issue, or if the technologist questions whether it is suitable for transfusion. Refer to *Evaluation of Platelet Suitability for Transfusion based on Swirling, Temperature, and Time.*
- If a platelet is not swirling (even after 60 minutes of agitation on the platelet rotator), then the platelet should be discarded.

If the technologist determines that the platelet is suitable for transfusion:

- In the Blood Bank computer, add the canned message ASWRL to the unit; document the fields of the ASWRL canned message. Refer to *Adding a Comment when Unit is Placed into Available Inventory*, in the *Triage* CDM / *Issue & Return* section.

If the Medical Director was consulted and determines that the platelet is suitable for transfusion:

- In the Blood Bank computer, add the canned message AMDOK to the unit; document the fields of the AMDOK canned message. Refer to *Adding a Comment when Unit is Placed into Available Inventory*, in the *Triage* CDM / *Issue & Return* section.

If the technologist or Medical Director determines that the platelet is NOT suitable for transfusion:

- Discard the platelet (physically and in the Blood Bank computer) and submit a variance.
- ~~Document a variance and submit to the Quality Assurance officer.~~

Definitions

- **Open system**: A system, the contents of which are exposed to air and outside elements during preparation and separation of components.

- **Closed system:** A system, the contents of which are not exposed to air or outside elements during preparation and separation of components.

Forms

- F-1566, *Record Of Transfusion Form*, aka crossmatch tag

References

- American Association of Blood Banks, *Standards for Blood Banks and Transfusion Services*, 5.13.5, *Comparison with Previous Records*, 27th edition, May 1, 2011
- American Association of Blood Banks, *Standards for Blood Banks and Transfusion Services*, 5.1.8A – *Requirements for Storage, Transportation, and Expiration*, 31st edition, April 1, 2018
- Brecher, M. E. and Hay, S. N. (2004), Platelet swirling. Transfusion, 44: 627. doi: 10.1111/j.1537-2995.2004.03428.x
- Holme, S., Sawyer, S., Heaton, A. and Sweeney, J. D. (1997), Studies on platelets exposed to or stored at temperatures below 20°C or above 24°C. Transfusion, 37: 5–11. doi: 10.1046/j.1537-2995.1997.37197176944.x
- College of American Pathologists Transfusion Medicine TRM. 44900, Platelet Component Acceptability Criteria, 2010
- College of American Pathologists Transfusion Medicine TRM. 44950 Platelet Component Storage, 2010
- College of American Pathologists Transfusion Medicine TRM. 44955, Bacterial Contamination in Platelets, 2010

Attachments

Job Aid: *Evaluation of Platelet Suitability for Transfusion based on Swirling, Temperature, and Time*

Authorized Reviewers

Chief ~~Chairman~~, Pathology and Laboratory Medicine
Medical Director and/or Designee, Blood Bank
Manager/Supervisor, Blood Bank
~~Quality Assurance, Blood Bank~~

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Document Control

Location of Master: Master electronic file stored on the Beaumont Laboratory server under S:/
Master printed document stored in the *Transfusion Medicine Standard Operating Procedures Manual.*
Number of Controlled Copies posted for educational purposes: 0
Number of circulating Controlled Copies: 0
Location of circulating Controlled Copies: NA

Document History

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Supervisor: Judy Easter	03/28/2012			
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Reviewed by: (Signature)	**Date**	**Revision #**	**Modification**	**Related Documents Reviewed/ Updated**
Approved by: Peter Millward, MD	07/30/2012			
Approved by: Peter Millward, MD	08/01/2013			
Revised by: Ashley Wilson	03/26/2015	r01.00.01	Added reference to F-409, *Weekly Platelet Inventory Monitor.*	
Approved by: Peter Millward, MD	03/27/2015			
Revised by: Ashley Wilson	08/17/2015	r01.01.00	Inserted Platelet Suitability graph, updated when to write a variance.	
QA: Anne Sepienza	02/03/2016			
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Elizabeth Sykes, MD	02/22/2018			
Revised by: Christopher Ferguson	04/09/2018	r01.01.01	Adjusted PLT swirling requirements and PLT stability for up to 30 hours to match current standards and policies.	
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Revised by: Christopher Ferguson	01/31/2019	r01.01.02	Removed F-409, *Weekly Platelet Inventory Monitor*. Form is no longer used. Changed *Supervisor* to *Manager*.	
Approved by: Craig Fletcher, MD	01/31/2019			
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Revised by: Samantha Maynard	09/01/2021	r01.02.00	Updated to PGDprime from Pan Genera Detection testing. Added info on pathogen reduced platelets. Added info on 7 day platelets, and lower platelet counts from suppliers.	
Manager:				
Approved by: Craig Fletcher, MD				

Document Control, cont.

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