

# Managing Platelet Refractory Patients

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## OBJECTIVES

- Define platelet refractoriness and associated conditions that may cause platelet refractoriness.
- Describe how platelet refractoriness may be diagnosed.
- Describe technical methods that may be used to provide information to help manage refractory patients.
- Illustrate through case studies how platelet refractory patients may be managed



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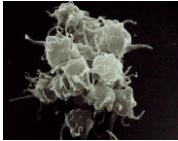
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## Platelet Antigen


- Present on other cells
  - ABO
  - HLA
- Platelet specific\*
  - HPA



\*Some also on other cells, particularly leukocytes and endothelial cells



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## Diagnosis of Platelet Refractoriness

- Less than expected 1 hour post count in 2 consecutive transfusions
  - Corrected Platelet Count Increment (CCI)
    - CCI of less than 5000-7500 would indicate a refractory response
  - Percent Platelet Recovery (PPR)
    - PPR of less than 20% would indicate a refractory response



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## Causes of Platelet Refractoriness

- Occurs in 20-70% of multitransfused thrombocytopenic patients
- Non-immune related
  - Bleeding, fever, sepsis, DIC, drugs
- Immune related
  - HLA/HPA sensitization, autoantibodies, certain drugs
  - PRA >20%



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How do we decide the next step?



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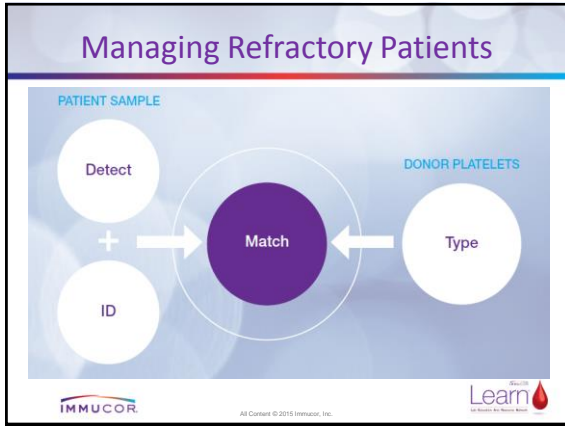
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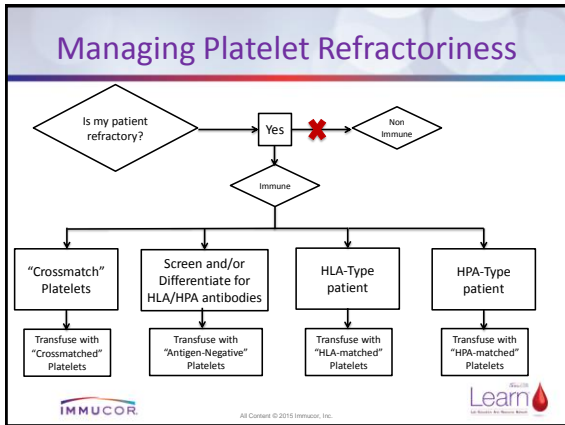
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- ### Choosing the right path....
- Preference
  - Patient's response
  - Patient's needs
  - Availability of product and inventory
  - Availability of testing resources
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### Types of Platelet Products

Product	Pros	Cons
ABO Matched	<ul style="list-style-type: none"> <li>Readily available</li> </ul>	<ul style="list-style-type: none"> <li>Does not address existing alloimmunization</li> </ul>
"Crossmatched"	<ul style="list-style-type: none"> <li>Short TAT</li> <li>"Compatible" platelet</li> </ul>	<ul style="list-style-type: none"> <li>Does not identify the specific underlying alloimmunization</li> <li>Requires platelet inventory</li> </ul>
Antigen Negative	<ul style="list-style-type: none"> <li>More potential donors can be identified</li> <li>Easier to find donors than HLA-matched</li> </ul>	<ul style="list-style-type: none"> <li>Patient antibody ID required</li> <li>TAT longer than "crossmatch"</li> <li>Requires platelet inventory</li> </ul>
HLA Matched	<ul style="list-style-type: none"> <li>Provides platelets matched to patient's antigens</li> </ul>	<ul style="list-style-type: none"> <li>Requires patient and donor HLA typing</li> <li>Can be difficult to find matches</li> <li>TAT can take days</li> <li>Does not address potential HPA alloimmunization</li> </ul>

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

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### Degree of HLA Match

Match Grade	Description
A	4 antigen match
B1U	1 antigen unknown or blank
B1X	1 cross reactive group (CREG)
B2UX	1 antigen blank and 1 CREG
C	1 mismatched antigen present
D	2 or more mismatched antigens present
R	Random


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Test Type	Use/Importance	Testing Platforms Available	Resources Required
Antibody Screening	Determine presence of HLA/HPA antibody	Lymphocytotoxicity	Highly skilled test
		Solid Phase SPRCA (Capture®)	Capture® Workstation
		Solid Phase ELISA	ELISA Reader
		Bead-based Immunoassay	Luminex®
Antibody Differentiation	Characterize antibody to select units typed as negative for corresponding HLA/HPA antigen	Solid Phase ELISA	ELISA Reader
Crossmatch	Quick method to detect antibody directed towards platelets selected for transfusion	Solid Phase SPRCA (Capture®)	<ul style="list-style-type: none"> <li>Capture® Workstation</li> <li>Platelet inventory</li> </ul>
Antigen - Match	Type for HLA/HPA to provide antigen matched platelets	Bead-based Immunoassay	Luminex®
		Molecular	<ul style="list-style-type: none"> <li>Molecular workstation</li> <li>Platelet Inventory</li> <li>Typed Donors</li> </ul>

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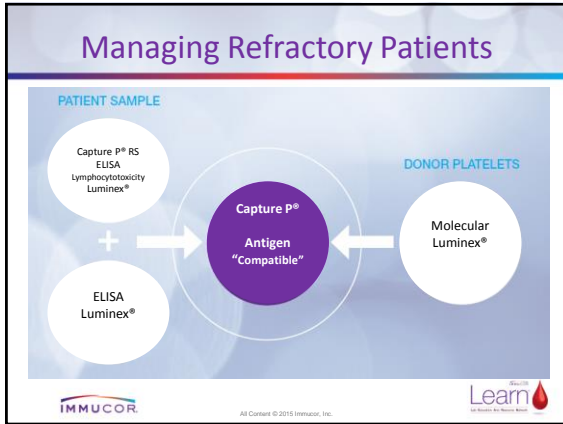
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### Testing Algorithms

- There is no standard approach to managing platelet refractory patients
- Testing algorithms vary depending on patients' needs and resources available

The Immucor and Learn logos are at the bottom.

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### Immucor's Platelet Portfolio

	Assay	Common Utility
Detection	Capture P® Ready Screen®	Platelet Antibody Screen
	Pak ELISA Family	HLA/HPA Antibody Detection
	Capture -P®	Platelet Antibody Detection (e.g. antibody screening or crossmatch)
	PakAuto	Platelet Autoantibody Detection
	LIFECODES® LifeScreen Deluxe	HLA Antibody Screen
	LIFECODES® Class I ID	HLA Antibody Detection
Typing	LIFECODES® Single Antigen Class I*	HLA Antibody Detection
	BioArray™ HPA BeadChip™ *	HPA Typing (HPA 1-9, 11, and 15)
	ThromboType®	HPA Typing (HPA 1-6 and 15)
	ThromboType® 1	HPA Typing (HPA 1 only)
	LIFECODES®HLA-A-eRES SSO Typing Kits	HLA Class I Typing (A Locus)
	LIFECODES®HLA-B-eRES SSO Typing Kits	HLA Class I Typing (B Locus) *Research Use Only

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