Component Preparation, Manufacturing and Modifications

Mahdokht Parsi, MPH, MT(ASCP)
Director of Operation, Immunohematology, Genomics & Frozen Laboratory
Mparsi@nybc.org

New York Blood Center

Current Practices in Transfusion Medicine
NEW YORK BLOOD CENTER

• Distribute one million blood products annually
  ► 400,000  Red Blood Cells
  ► 80,000   Platelets
  ► 100,000  Plasma
  ► 50,000 liters  Recovered Plasma
  ► 108 million units of factor products for hemophiliacs
Core Operations

• Component Manufacturing
• Quality Control/Reference Laboratories
• Flow Cytometry Laboratory
• Immunohematology Laboratory
• Genomics Laboratory
• Frozen blood Laboratory
• HLA Laboratory
• Hospital Services Departments
• Customer Care Center
  ▶ Management of outsourced donor screening testing
Component Laboratory/Blood Manufacturing and Hospital Services

• Component Laboratories are located in Westbury and Long Island City (LIC)
  Process Whole Blood into Components
    • RBC leukoreduced
    • P24(24 hour Plasma), FFP, Recovered Plasma
    • Cryoprecipitate, Pooled Cryoprecipitate
    • Acrodose Platelets (pooled 5 unit WBDP)
    • Buffy Coats for Research orders
  ▶ Process Apheresis Platelets and RBC

• Hospital Services are located in Westbury and LIC with Depots in Pennsylvania
  ▶ Distribute over 1 million products annually
Flow Cytometry, HLA and QC/Reference labs

• Flow Cytometry
  - Support NCBP (National Cord Blood Program) & Cell Therapy Laboratory
    - CD 34 stem cell enumeration & viability
    - Fresh & Post thaw cord blood & Peripheral Stem Cell samples
  - Quality control of leukoreduced products
    - Residual WBC counts on SDP, RBC

• HLA Laboratory
  - HLA testing for Hospital Customers
  - Perform HLA typing on Platelet Donors

• QC/Reference
  - Performs product qualification and monthly QC for all blood products release (bacterial testing, Platelets yield & PH)
  - Platelets antibody screen & crossmatching
Laboratory of Immunohematology

- Provide reference laboratory services to assist hospitals in solving patient’s complex antibody problems and supplying suitable units of blood.
- Resolution of the complex serological problems submitted by the hospital blood banks we serve locally as well as other laboratories nationally and internationally.
- Link the patients with the rare blood inventory by precisely matching the alloimmunized patients with the antigen-negative donor units.
- Provide antigen-negative red blood cells (RBCs) to support the patients for whom we have identified these antibodies.
- High-volume donor testing to identify those rare “needle in the haystack” donors whose RBCs lack a high prevalence blood group antigen, such as U− or Js(b−) donors.
- Investigates ABO/Rh and antigen typing discrepancies.
- Performs additional Antigen Typing of RBCs.
Genomics Laboratory

- DNA molecular testing can improve blood typing accuracy, help to select compatible donors and improve transfusion safety and outcomes for patients.

- In addition DNA testing helps evaluate fetal risk for hemolytic disease of the fetus due to maternal antibodies to red cell antigens, confirmation of maternal type, parental zygosity and fetal type.

- The lab offers testing of DNA and RNA for blood group antigens and DNA testing for Platelet and neutrophil antigen.

- DNA testing is performs by PCR and gene specific amplification and sequencing.

- The HEA beadchip assay from BioArray is an automated multiplex PCR assay that detects presence or absence of selected alleles and detects polymorphisms associated with 38 blood group antigens.
Frozen Blood Laboratory

- Maintain liquid Antigen Negative Inventory
  - Approximately 300+/week antigen phenotyped RBC
- Sickle-cell (Hgb-S) testing
- Frozen blood woks closely with Immunohematology lab to manage the transfusion need of alloimmunized patients.
- The lab freeze Rare Blood
  - Maintain one of the largest collections of frozen rare RBC units
    - Washed RBC
    - Washed Platelets
    - Deglycerolize
Laboratory Administration

• Customer Care Center
  ► Release test results to fee testing Customers
  ► Release of Test Results
    • CTS (Creative Testing Solution)
  ► Specialty Product orders
    • Granulocytes
    • HLA matched Platelets
    • Antigen Negative RBCs
  ► Nursing Audit – if applicable 100% review of all donor forms

• Sample Management
  ► Coordinate donor testing
  ► Distributing samples to the testing laboratory
Products and Quality Control
# Blood Products

<table>
<thead>
<tr>
<th>Whole Blood</th>
<th>Platelets</th>
<th>Plasma</th>
</tr>
</thead>
<tbody>
<tr>
<td>RBCs – Leukoreduced</td>
<td>Platelet, Pheresis (Single Donor Platelets)</td>
<td></td>
</tr>
<tr>
<td>RBCs – Washed</td>
<td>Acrodose Platelets, Pooled</td>
<td></td>
</tr>
<tr>
<td>RBCs – Deglycerolized</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irradiated</td>
<td>Granulocytes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cryoprecipitate</td>
</tr>
</tbody>
</table>
Processing Tree Platelets

Start product is Platelet Rich Plasma (See RBC)

Was PRP removed from RBC within 8 hours?

YES

Continue processing

Centrifuge using "heavy spin" at 20-24°C

Place in extractor

Separate platelet from plasma leaving 45-65 ml In platelet

Allow platelets to rest for at least 1 hour

Place platelet in a WIP/quarantine 20-24°C agitator

NO

Do not make platelets

Label plasma as Recovered Plasma as applicable

Place unit in freezer (InstaCool)

Store in quarantine/WIP Freezer - 20°C Or colder for storage

Label plasma appropriately

Freeze in InstaCool

Place in Quarantine Freezer - 20°C For storage
Whole Blood

- Cross Matching
- Approximate Volume
- Life Span/Shelf Life
- How Stored
- Indications for Product Selection
RBCs - Leukoreduced

- Cross match required
- Approximate volume – 340-400 ml
- Shelf Life – 21-42 days (depending on the additive solution that is used)
RBCs – Leukoreduced

• Indications for product selection
  ▶ Based on hospital guidelines for Hgb/Hct.
  ▶ When O2 carrying, capacity cannot be corrected with alternative therapy.
  ▶ Prevention of febrile transfusion reactions.

• How Stored – 1-6°C in a monitored blood refrigerator
RBCs – Washed/Deglycerolized

- Cross match required
- Approximate volume – 220 ml.
- Shelf Life – 24 hours after washing
- How Stored – 1-6°C in a monitored blood refrigerator
- Indications for Washed RBC—prevention of severe allergic reactions to plasma proteins, as for patients with anti-IgA antibodies.
- Indications for product Deglycerolized RBC – patients with antibodies requiring rare units
Plasma Products

• P24 – Frozen within 24 hours
  ▶ Isolated coagulation deficiencies
  ▶ Microangiopathic hemolytic anemias (TTP)
  ▶ Congenital or acquired coagulation factor deficiencies

• FFP is specifically indicated for patients with a severe Factor V deficiency and severe Protein S deficiency

• Cross match not required

• Approximate Volume – 200-275 ml, Jumbo up to 600 ml

• Shelf Life one year frozen, 24 hours after thawing- It can be extended to 5 days.

• How Stored in hospital, after thawing, 1-6°C in a monitored blood refrigerator
Whole Blood Derived Platelets (WBDP)  
Formerly Randoms

- Approximate volume – 45-60 ml/unit, usually dispensed as 5 pool unit
- Shelf life – Single units 5 days; 4 hours after pooling
- Acrodose, 5 units Pooled -5 day shelf life
Whole Blood Derived Platelets (WBDP)

• How stored – 20-24°C (room temperature) with constant gentle agitation
• DO NOT REFRIGERATE
Platelet Pheresis
(Single Donor Platelets)

• Approximate volume 300 ml
• Shelf life 5 days
Platelet Pheresis
(Single Donor Platelets), ctd.

- How stored – 20-24°C (room temperature) with constant gentle agitation
- DO NOT REFRIGERATE
- Indications for product selection:
  - Clinical refractoriness
  - Aplastic anemia
Granulocytes - Pheresis

- Shelf life – 24 hours
- DO NOT REFRIGERATE

- Indications for product selection:
  - Selected infected leukopenic patients with a granulocyte count of less than 0.5x10^9/L who have not responded to more than 48 hours of appropriate antibiotic therapy.
Cryoprecipitate

- Approximate volume – app 20 ml/bag may be dispensed as single units or pooled in 5 bag units
- Shelf life – one year frozen
Cryoprecipitate

• Shelf life after thawing
  ▶ Coagulation Factor VIII - 6 hours
  ▶ Pooled CRYO - 4 hours after pooling if not sterilely pooled
  ▶ Sterilely pooled CRYO – 6 hours

• How stored in hospital— 20-24°C (room temperature); *Transfuse Immediately*

• DO NOT REFRIGERATE
Cryoprecipitate

• Indications for product selection:
  ▶ Treatment of patients with VonWillebrand’s Disease.
  ▶ CRYO serves as a therapeutic source of fibrinogen. May be indicated for a fibrinogen level less than 150 mg/dL.
  ▶ May also be useful in some surgical patients.
Quality Control of Products
# Red Blood Cells

<table>
<thead>
<tr>
<th>Product</th>
<th>Requirements</th>
<th>Samples Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leukoreduced RBC</td>
<td>$&lt; 5 \times 10^6$ WBC, $\geq 85%$ Recovery</td>
<td>124 samples per month</td>
</tr>
<tr>
<td>TRIMA 6.0 – leukoreduced</td>
<td>$\geq 128$ ml red cell, $&lt; 5 \times 10^6$ WBC</td>
<td>50 collection per site per month</td>
</tr>
<tr>
<td>ALYX leukoreduced</td>
<td>Final HGB $\geq 42.5$g/dl, $&lt; 5 \times 10^6$ WBC</td>
<td>50 collection per site per month</td>
</tr>
<tr>
<td>Amicus - leukoreduced in Component Lab</td>
<td>Final HGB $\geq 42.5$g/dl</td>
<td>100% testing</td>
</tr>
</tbody>
</table>
### Platelets

<table>
<thead>
<tr>
<th>Product</th>
<th>Requirement</th>
<th>Samples Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WBDP</strong> <em>(Acrodose)</em></td>
<td>Platelet yield &gt;5.5 X 10^{11}</td>
<td>100% testing</td>
</tr>
<tr>
<td></td>
<td>pH ≥ 6.2</td>
<td>60 per month with no failure</td>
</tr>
<tr>
<td></td>
<td>WBC &lt; 5 X 10^6</td>
<td></td>
</tr>
<tr>
<td><strong>SDP</strong></td>
<td>Platelet Yield ≥3.0 X 10^{11}</td>
<td>100% testing for product qualification</td>
</tr>
<tr>
<td></td>
<td>pH ≥ 6.2</td>
<td>60 per month with no failure</td>
</tr>
<tr>
<td></td>
<td>WBC &lt; 5 X 10^6</td>
<td></td>
</tr>
</tbody>
</table>
# Frozen Product

<table>
<thead>
<tr>
<th>Product</th>
<th>Requirement</th>
<th>Samples Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frozen Blood</td>
<td>&lt; 1% residual glycerol</td>
<td>4 washed cells/month</td>
</tr>
<tr>
<td></td>
<td>&gt; 80% red cell recovery</td>
<td></td>
</tr>
<tr>
<td>Cryoprecipitate</td>
<td>≥ 80 IU Factor VIII</td>
<td>4 individual/month</td>
</tr>
<tr>
<td></td>
<td>≥ 150 mg Fibrinogen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pools must contain 5X individual requirement</td>
<td></td>
</tr>
<tr>
<td>Recovered Plasma</td>
<td>≥ 0.7 IU per ml of Factor VIII</td>
<td>4/month</td>
</tr>
<tr>
<td>Testing is for plasma fractionators only. There is no FDA requirement</td>
<td>In each component lab</td>
<td></td>
</tr>
<tr>
<td></td>
<td>≥ 50 g/Liter total protein</td>
<td></td>
</tr>
</tbody>
</table>

In each component lab
Bacterial Detection Testing of Platelets
Bacterial Detection in Platelets

• A major risk of transfusion related fatalities
  ▶ Platelets stored at Room temperature

• Clusters of infection/deaths
  ▶ RDP Contamination = 1:2-4,000
  ▶ SDP Contamination = 1:15,000
  ▶ Fatalities = ~ 1:40,000 ?? (under-reported)
  ▶ Gram negative organisms major clinical problem

• Sources of Bacterial Contamination
  ▶ Donor skin flora (50-60%)
  ▶ Donor bacteremia (40-50%)
Avoiding Bacterial Contamination in Platelets

Improved skin disinfection with Chlorhexidine

Testing at blood center or hospital

Diversion pouches
Regulations

• FDA Guidance requiring hospitals to report fatalities related to contamination

• AABB standards require bacterial detection of all platelet products since March 2004

  ▶ 5.1.5.1 The blood bank or transfusion service shall have methods to limit and to detect or inactivate bacteria in all platelet components. Standard 5.6.2 applies (Protection against contamination)
Detection of Bacterial Contamination in Platelets

- Use of approved devices for “QC” purposes for SDP – Culture methods
  - Culture media (BacT/Alert, CO₂ production)
  - Hemonatics eBDS; O₂ consumption
  - Leukocyte reduced products

- Other methods - Dip-stick, glucose meters, pH, culture plates; Scan System (fluorescence)
Detection of Bacterial Contamination in Platelets - Procedure

- Sample platelets into aerobic bacterial culture medium after a 24 hrs. post collection at 22 °C
- Incubated in the BacT/Alert device and monitor growth continuously.
  - If negative at 16 hrs., release platelets to inventory; continue to monitor until expiration.
  - If positive, retrieve the product and send samples for confirmation and species identification.
  - Notify hospital if growth occurs after release
False Negative Results and Reactions

• Automated systems currently in use have a declared sensitivity of 1-10 CFU/mL. The claim is based on the 24 hrs. holding period. This should give organisms present to enter log phase of growth, thus increasing the probability of detection.

• Bacteria may be present in very small numbers (e.g. 1-10/bag or 0.003-0.03 CFU/mL).
  ▶ At these low concentrations, growth may be idiosyncratic
  ▶ Slow growing organisms may be present at low concentrations, may have a prolonged lag phase and may be missed by sampling.
  ▶ They may then reach significant concentrations by the time of transfusion

• Breakthrough cases are most often due to slow growing skin flora

• Fatalities and septic reactions have continued even after implementation of testing

---

Pathogen Reduction

- Pathogen Inactivation for Platelets by “INTERCEPT”
The INTERCEPT Blood System for Platelets

- Step 1: Amotosalen
- Step 2: Illumination
- Step 3: CAD
- Process Complete: Storage

The INTERCEPT Blood System for Plasma
1. Sterile connect the platelet or plasma product to an INTERCEPT Set

2. Gravity-transfer the platelets or plasma and amotosalen into the illumination container and mix

3. Illuminate the product

4. Platelets: Transfer the platelets by gravity into the CAD bag. Incubate the platelet product with continuous agitation

4. Plasma: On plasma sets, the CAD is a flow through device. Gravity-transfer the plasma through the CAD.

5. Transfer the product by gravity into the final storage container(s) (1 or 2 platelet containers, 3 plasma containers).
**Mechanism of Action**

Targeting DNA and RNA to prevent pathogen proliferation

1. Intercalates Into Regions of DNA and RNA

2. Crosslinks Upon UVA Illumination

3. Blocks Replication, Transcription and Translation

---

Granulocytes - Pheresis

• Shelf life – 24 hours
• DO NOT REFRIGERATE

• Indications for product selection:
  ▶ Selected infected leukopenic patients with a granulocyte count of less than 0.5x10^9/L who have not responded to more than 48 hours of appropriate antibiotic therapy.
Cryoprecipitate

- Approximate volume – app 20 ml/bag may be dispensed as single units or pooled in 5 bag units
- Shelf life – one year frozen
Cryoprecipitate

• Shelf life after thawing
  ▶ Coagulation Factor VIII - 6 hours
  ▶ Pooled CRYO - 4 hours after pooling if not sterilely pooled
  ▶ Sterilely pooled CRYO – 6 hours

• How stored in hospital—20-24°C (room temperature);
  *Transfuse Immediately*

• DO NOT REFRIGERATE
Cryoprecipitate

• Indications for product selection:
  ▶ Treatment of patients with VonWillebrand’s Disease.
  ▶ CRYO serves as a therapeutic source of fibrinogen. May be indicated for a fibrinogen level less than 150 mg/dL.
  ▶ May also be useful in some surgical patients.
Distribution

Inventory Management
NEW YORK BLOOD CENTER

• Distribute one million blood products annually
  ▶ 400,000 Red Blood Cells
  ▶ 80,000 Platelets
  ▶ 100,000 P24
  ▶ 50,000 liters Recovered Plasma
  ▶ 108 million units of factor products for hemophiliacs
Inventory Management Considerations

- Need to have enough product…

  - **Pediatric RBCs**
    - CPD/Adsol
    - CMV and HGBS negative
    - O pos and O neg

  - **Antigen Negative Blood**
    - Ethnicity
      - NYBC donor base
        - 70.2% White, 12.2% Hispanic/Latino, 8.0% Black, 5.9% Asian, 1.4% Multiple race, 0.2% American Indian and 1.4% Other
Typical Red Cell Antigen Inventory Numbers

• Daily percentage of RBCs are tested for RH (C,c,E,e) & Kell antigens

• Liquid Inventory: Approximately 350 units of RBCs labeled for common antigens available on any given day

• Frozen Inventory: More than 5000 RBCs screened for high incidence antigens and uncommon combinations of common antigens

• Regular Inventory: Thousands of RBCs. Many have been typed for common antigens
Routine Testing for Antigens

- Select all African American/Hispanic donors who have not been previously tested (Ethnicity is a Test Result)
- Select random number of other donors for testing
- Consider ABOD group of the donor (Type O & A)
- Do not test donors who have been previously tested and have results in the database for screening
- Confirm donors who have been tested for antigens once before
- African American donors must be tested for Hemoglobin S
- Test samples for common antigens such as: Rh, Kell, Fy^a,Fy^b,Jk^a,Jk^b,S,s
Example of Daily Report to Testing Lab

Attached please find BSL Antigen List

Report Description: Report ID 707. This report provides a list of antigen and HGBS testing requirements.

Last generated at: 11/10/2008 10:23:34 AM
Targeting Donors for High Prevalence Testing

• **Targeted Donor Populations**
  - Selective Screening of Previously Untested Donors
  - Selective Testing of Previously Untested African American and Latino Donors

• **Resources**
  - Non-licensed Reagents for High Prevalence Antigens
  - Automated Testing Methods for Genomics
  - Automated Multifactor Prioritization Algorithms for Sample Selection
  - Create a list in BOSS, pull samples and send them to the lab for testing
Selective Testing for High Prevalence Antigens

• Testing for high prevalence antigens includes the use of:
  • DNA-based assays for $\text{Hy}^a$, $\text{Jo}^a$, $\text{Do}^a$, $\text{Do}^b$
  • Patient plasma for $\text{Coa}^a$, $\text{Jr}^a$, $\text{Js}^b$, $\text{Vel}$, $\text{hr}^S$, $\text{Yt}^a$, $\text{Lan}$, $\text{Rh}17$
  • Human monoclonal antibodies
High Prevalence Antigen Testing Example

• Check donor ethnicity. Identify African-American/Hispanic donors

• Determine if the donor has been screened for high prevalence antigens. If the donor has not been screened, the sample is placed on the list to be screened

• Determine if the donor has been screened for Hemoglobin S trait. If the donor has not been screened, place the sample on a list to be tested for Hemoglobin S trait

• The list of samples is retrieved from the laboratory information system by BOSS
  ▶ A single list is e-mailed to a sample management who will pull the samples from storage and send to the NYBC Immunohematology and Genomics Laboratory
## Samples for High Prevalence Antigen Testing

<table>
<thead>
<tr>
<th>Donation Number</th>
<th>Donation Date</th>
<th>Ethnicity</th>
<th>ABO</th>
<th>CMV</th>
<th>HBG</th>
<th>Antigens</th>
</tr>
</thead>
<tbody>
<tr>
<td>WD470006194553CCD</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Positive</td>
<td>Negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD4700062198000K</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Negative</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD47000621220000N</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Negative</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD470008539563DC</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Positive</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD47000654376600C</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Positive</td>
<td>Positive</td>
<td></td>
<td>Negative</td>
</tr>
<tr>
<td>WD4700065141100U</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Negative</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD47000863406007</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Positive</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD4700088038680B</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Positive</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD47000970187300C</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Positive</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD47000870187400C</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Positive</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD47000870187500Z</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Positive</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD47000870187600X</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Positive</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD47000870187700V</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Positive</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD47000970188000T</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Positive</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD47000870188700R</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Positive</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD47000870188900N</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Positive</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD47000870189000C</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Positive</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD47000970189400T</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Positive</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD47000970189800L</td>
<td>11/06/2008</td>
<td>Hispanic/Latino</td>
<td>O Positive</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Daily Inventory Summary

## New York Blood Center

### Total RBCs (WIP + Finished Goods + In Trunk 12,253)

<table>
<thead>
<tr>
<th>Column</th>
<th>WIP</th>
<th>Finished Goods</th>
<th>In Trunk</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABE</td>
<td>54</td>
<td>14</td>
<td>1</td>
<td>69</td>
</tr>
<tr>
<td>B</td>
<td>23</td>
<td>18</td>
<td>2</td>
<td>43</td>
</tr>
<tr>
<td>C</td>
<td>6</td>
<td>3</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>86</td>
<td>43</td>
<td>3</td>
<td>132</td>
</tr>
</tbody>
</table>

### Total Available (WIP + Finished Goods + In Trunk)

<table>
<thead>
<tr>
<th>Column</th>
<th>WIP</th>
<th>Finished Goods</th>
<th>In Trunk</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABE</td>
<td>54</td>
<td>14</td>
<td>1</td>
<td>69</td>
</tr>
<tr>
<td>B</td>
<td>23</td>
<td>18</td>
<td>2</td>
<td>43</td>
</tr>
<tr>
<td>C</td>
<td>6</td>
<td>3</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>86</td>
<td>43</td>
<td>3</td>
<td>132</td>
</tr>
</tbody>
</table>

### Available RBC Units

#### Available RBC Units by Blood Type

<table>
<thead>
<tr>
<th>Blood Type</th>
<th>Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABE</td>
<td>54</td>
</tr>
<tr>
<td>B</td>
<td>23</td>
</tr>
<tr>
<td>C</td>
<td>6</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
</tr>
</tbody>
</table>

### Available RBC Units by Product Line

<table>
<thead>
<tr>
<th>Product Line</th>
<th>Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABE</td>
<td>54</td>
</tr>
<tr>
<td>B</td>
<td>23</td>
</tr>
<tr>
<td>C</td>
<td>6</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
</tr>
</tbody>
</table>

### Blood Center Operations

- **New York Blood Center**
- **Total RBCs**: 12,253
- **WIP**: 86
- **Finished Goods**: 43
- **In Trunk**: 3
- **Available RBC Units by Blood Type**: ABE (54), B (23), C (6), D (2)
- **Available RBC Units by Product Line**: ABE (54), B (23), C (6), D (2)

---

### Additional Tables

- **Whole Blood Type**
- **Plasma**
- **Platelets**
- **xor**

---

**Note:** This is a sample of the entire inventory summary page. The full page includes detailed tables and charts for each blood type and product line, providing comprehensive information on inventory levels and available units.
## LRBC Inventory - Overview

### Days Supply

<table>
<thead>
<tr>
<th>Type</th>
<th>FG</th>
<th>WIP</th>
<th>Total</th>
<th>Number of Units Backordered</th>
<th>True Total</th>
<th>Wednesday (Yesterday)</th>
</tr>
</thead>
<tbody>
<tr>
<td>O-</td>
<td>1.8</td>
<td>1.4</td>
<td>3.1</td>
<td>0</td>
<td>3.1</td>
<td>3.1</td>
</tr>
<tr>
<td>A-</td>
<td>8.0</td>
<td>1.9</td>
<td>9.9</td>
<td>0</td>
<td>9.9</td>
<td>9.4</td>
</tr>
<tr>
<td>A+</td>
<td>6.8</td>
<td>3.7</td>
<td>10.5</td>
<td>0</td>
<td>10.5</td>
<td>10.5</td>
</tr>
<tr>
<td>O+</td>
<td>9.3</td>
<td>3.8</td>
<td>13.1</td>
<td>0</td>
<td>13.1</td>
<td>12.9</td>
</tr>
<tr>
<td>B-</td>
<td>13.4</td>
<td>2.1</td>
<td>15.5</td>
<td>0</td>
<td>15.5</td>
<td>14.9</td>
</tr>
<tr>
<td>B+</td>
<td>12.1</td>
<td>3.8</td>
<td>15.8</td>
<td>0</td>
<td>15.8</td>
<td>15.6</td>
</tr>
</tbody>
</table>

**Total Days (incl WIP)**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Lower</th>
<th>Upper</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>0.0</td>
<td>4.9</td>
<td>Well Below Target</td>
</tr>
<tr>
<td>Amber</td>
<td>5.0</td>
<td>7.9</td>
<td>Below Target</td>
</tr>
<tr>
<td>Green</td>
<td>8.0</td>
<td>10.9</td>
<td>On Target</td>
</tr>
<tr>
<td>Blue</td>
<td>11.0</td>
<td>13.9</td>
<td>Above Target</td>
</tr>
<tr>
<td>Purple</td>
<td>14.0</td>
<td>+</td>
<td>Well Above Target</td>
</tr>
</tbody>
</table>

---

*New York Blood Center*
## Platelet Inventory

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>6 AM Net BOD Inventory</th>
<th>Sweet Spot Range</th>
<th>Status</th>
<th>SDP Release</th>
<th>Acrodose Release</th>
<th>Total Inventory</th>
<th>Demand Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/31</td>
<td>Mon</td>
<td>113</td>
<td>65</td>
<td>165</td>
<td>in sweet spot*</td>
<td>281</td>
<td>0</td>
<td>394</td>
</tr>
<tr>
<td>4/1</td>
<td>Tue</td>
<td>113</td>
<td>65</td>
<td>165</td>
<td>in sweet spot*</td>
<td>181</td>
<td>0</td>
<td>294</td>
</tr>
<tr>
<td>4/2</td>
<td>Wed</td>
<td>90</td>
<td>65</td>
<td>165</td>
<td>in sweet spot*</td>
<td>209</td>
<td>5</td>
<td>304</td>
</tr>
<tr>
<td>4/3</td>
<td>Thu</td>
<td>64</td>
<td>65</td>
<td>165</td>
<td>below target</td>
<td>204</td>
<td>9</td>
<td>276</td>
</tr>
<tr>
<td>4/4</td>
<td>Fri</td>
<td>125</td>
<td>65</td>
<td>165</td>
<td>in sweet spot*</td>
<td>162</td>
<td>16</td>
<td>303</td>
</tr>
<tr>
<td>4/5</td>
<td>Sat</td>
<td>150</td>
<td>65</td>
<td>165</td>
<td>in sweet spot*</td>
<td>127</td>
<td>16</td>
<td>293</td>
</tr>
<tr>
<td>4/6</td>
<td>Sun</td>
<td>191</td>
<td>65</td>
<td>165</td>
<td>above target</td>
<td>189</td>
<td>14</td>
<td>393</td>
</tr>
</tbody>
</table>
Thank you!

Mparsi@nybc.org