



American Red Cross Biomedical Services

**A Leader in Providing Lifesaving Blood
and Blood Products to the Nation**

Table of Contents

Executive Summary	3
A Proud History of Service to the Nation	6
A Leader in Research and Testing	8
Working to Ensure an Adequate Blood Supply	9
Protecting the Safety of Donors and Patients	10
Coordinating with the FDA to Improve Blood Safety	11
Measurable Progress in Improving Blood Safety	14
A Commitment to America’s Blood Donors and Patients	14

Executive Summary

The American Red Cross plays a critical role in our Nation's health care system. It is the largest single supplier of blood and blood products in the United States, collecting and processing more than 40 percent of the blood supply and distributing it to some 3,000 hospitals and transfusion centers nationwide.

The Red Cross also plays a leading role in protecting the safety of donors and patients and increasing the availability of blood. It has been among the first to help develop and implement testing for infectious diseases, maintains five state-of-the-art national testing labs, and is frequently the single major contributor to clinical trials to improve blood safety. The U.S. blood supply has never been safer than it is today, and Red Cross blood is considered among the safest in the world.

Providing life-saving blood and blood products to patients is a key component of the Red Cross mission to help people in times of emergency and disasters. It is also part of our Nation's history.

A Proud History of Service to the Nation

During World War II, America turned to the Red Cross to develop a supply of lifesaving blood on a massive scale. This led to the establishment of the American Red Cross Blood Donor Service, which collected 13.3 million pints of blood plasma for use by our armed forces in World War II. After the war, the Red Cross introduced the first nationwide civilian blood program. Today, each year, the Red Cross collects 6.5 million units of blood from 4 million donors nationwide, and these collections result in 9.5M blood products.

A Leader in Research and Testing

In addition to being the single largest supplier of blood in the U.S., the American Red Cross is a leader in research and testing to protect the safety of the blood supply. The Red Cross was among the first to develop and implement testing for many infectious diseases including, HIV, Hepatitis B and C viruses, West Nile virus, and more recently the agent of Chagas disease. Red Cross also has the first-of-its-kind nationwide hemovigilance program to examine donor and patient adverse reactions. The data from this effort have been used to move the Red Cross – and the entire blood industry – toward safer transfusions through changes in practices and procedures.

Red Cross experts play an important role in policies and standards for the industry. By serving on key committees of AABB (formerly known as the American Association of Blood Banks) and other blood-related organizations – and working closely with the U.S. Food and Drug Administration (FDA) – the Red Cross provides valuable data and expertise that influences the direction of the blood banking industry.

Working to Ensure an Adequate Blood Supply

The Red Cross is constantly working to increase the availability of blood and blood products. This includes educating potential donors about healthy habits that will reduce deferrals such as for low iron, improving the yield from platelet donors and using containers that extend the time that blood can be safely shipped.

Increasing diverse blood donor recruitment is critical to the future of our Nation's blood supply. The Red Cross is implementing initiatives throughout the country to increase the number of blood donors in diverse communities and raise awareness of the need to give blood. Partners include organizations like the Sickle Cell Disease Association, the Miss Taiwan Foundation, faith-based and community groups and media partners like Telemundo and LaRaza radio.

The Red Cross also works to find rare blood donors to meet the specialized needs of patients all over the country. Through its 39 Immunohematology Reference Laboratories, offering support to hospitals across the country, and its collaboration with AABB on the American Rare Donor Program, the Red Cross helps insure that patients will get the blood they need at any time of the day or night.

Protecting the Safety of Donors and Patients

Without the generosity of donors, who roll up their sleeves to give blood, the Red Cross could not support the many patients, families, hospitals and communities that rely on it in times of need. That is why the Red Cross is dedicated to providing a safe environment for those who give blood and a safe product for those who receive blood.

From the moment a potential blood donor walks into a Red Cross blood donation center, until the blood is shipped to hospitals and patients are monitored for adverse reactions, a sequence of steps are performed to ensure the safety of the blood donor and the patients who receive blood.

- A comprehensive screening of the donor's medical history is performed.
- A short physical exam is given.
- Blood is tested in one of five state-of-the-art Red Cross national testing labs.
- Blood is quarantined until results of tests are finalized.
- After distribution to hospitals, the Red Cross continually monitors and investigates any reported adverse reactions.

Many of these systems have overlapping effects or are redundant to provide layers of safety. All of these activities are managed under rigorous quality systems and are stringently regulated by the FDA.

Coordinating with the FDA to Improve Blood Safety

The Red Cross' top priority is the safety of the blood it supplies. While the blood supply will never be without risk, the Red Cross is committed to making it as safe as it can possibly be.

The Red Cross and other blood banks are working to minimize problems with blood products. While there is no data available to compare the overall success of individual blood banks, there is data to show that the Red Cross has a proportionately lower percentage of recall events when compared to the rest of the industry. A recall is where product that may not conform to safety standards is removed from the market.

The Red Cross works continuously to improve blood safety by:

- Creating a culture where everyone in the organization understands blood safety is the highest priority and reinforcing that with better training, increased supervision and accountability
- Complying with Federal and State laws and regulations that set standards for operating blood banks, laboratories, and other facilities at which donors give blood, and where blood is prepared for distribution to hospitals and patients
- Coordinating with the FDA, which regulates blood and the operations of blood banks, to achieve sustained compliance with an Amended Consent Decree which prescribes detailed standards for Red Cross operations

The Amended Consent Decree imposes stringent operating and reporting requirements on the Red Cross and financial penalties for non-compliance with laws, FDA regulations and Red Cross standard operating procedures.

To improve its performance in accordance with the applicable law and the Decree, the Red Cross has implemented system-wide changes to its operations. Three keys to this effort are:

1. **Biomedical Services Compliance Plan** – a comprehensive plan with specific action steps to help achieve sustained compliance
2. **Standardization** – a vigorous effort to help ensure Red Cross blood services operate in the same way in every location
3. **Technology and Process improvements** – introduction of new technologies and systems to reduce the potential for human error

Measurable Progress in Improving Blood Safety

As a result of Red Cross efforts to continuously improve its blood services, the Red Cross has made great strides in improving our systems and processes, and there has been a steady and dramatic decrease in overall problems associated with blood collection since 2006.

Because of these renewed efforts, between July 2006 and December 2008 the Red Cross has demonstrated the following improvements:

- 52% reduction in overall problems
- 64% reduction in laboratory testing issues
- 28% reduction in recalls
- 68% reduction in storage, shipping and return issues
- 78% reduction in blood collection time and documentation issues

A Commitment to Donors and Patients

America depends on the Red Cross to ensure a safe and adequate blood supply for the Nation, and the Red Cross is committed to meeting that responsibility.

As a leader in the blood banking industry, the Red Cross has implemented state-of-the-art testing to advance the safety of blood donors and patients. It will continue to lead the way in testing because this research helps save lives and results in a safer blood supply.

The Red Cross is also committed to a sustained effort to reduce problems with the blood supply to an absolute minimum. While it has made significant progress in reducing problems, the Red Cross recognizes that there is more work to do, and it will continue to focus on this effort as its top priority.

Finally, the Red Cross is committed to the health and safety of every blood donor who volunteers to roll up their sleeve and every patient who receives blood. We appreciate all those who support the life-saving mission of the American Red Cross by giving blood.

A Proud History of Service to the Nation

The 1940s – World War II

In early 1940, England faced possible invasion from Germany and its allies, and lifesaving blood could be needed on a massive scale by both the civilian population and the military forces in Britain. In anticipation of this need, the Blood Transfusion Betterment Association in New York, supported financially by the American Red Cross, undertook a pilot project to collect blood plasma for shipment to the British Isles. As a first step in the program, eight New York City hospitals began collecting blood in August 1940, in what became known as the Plasma for Britain Project.

When Germany's invasion did not materialize, it was decided to terminate the Plasma for Britain Project. By this time, however, it had become apparent that America probably would be drawn into the war. Military authorities in the United States were concerned with the need for a stockpile of blood reserves if hostilities should break out. After discussions with medical leaders and the American Red Cross, the government asked the Red Cross to establish a pilot program similar to the Plasma for Britain Project, but on a smaller scale. The pilot center was set up in New York City and began operation in February 1941.

The outgrowth of this project was the American Red Cross Blood Donor Service, which resulted in the collection of 13.3 million pints of blood plasma for use by the armed forces in World War II.

The 1950s and 1960s – First Civilian Blood Program

After World War II, the Red Cross introduced the first nationwide civilian blood program. It began collecting blood products through 31 U.S. regional blood centers. By 1962, the number of Red Cross blood centers increased to 55 with collections of approximately 50% of the U.S. blood supply. The remaining supply was collected by 123 non-Red Cross community blood centers and 4,400 hospital blood banks.

The 1970s and 1980s – New Viruses and New Testing

While blood collections continued to be a priority for the blood banking industry, by the 1970s and 1980s an increased emphasis on safety arose as a result of viruses threatening the safety of the blood supply. In addition to syphilis testing (which had been the only infectious disease agent for which blood was tested), new tests were introduced to interdict donations that carried potentially harmful viruses:

- Hepatitis B virus (HBV) testing - 1971
- Human Immunodeficiency virus (HIV) - 1985
- Surrogate testing for Hepatitis C virus (HCV) - 1987
- Human T-Lymphotropic virus (HTLV-I and HTLV-II) - 1989
- First generation test for HCV - 1990
- HIV p24 antigen - 1996 (improved by supplementing previous tests for this virus)
- Nucleic Acid Testing for HIV and HCV - 1999 (tests were now detecting the actual genetic material of the virus in addition to tests detecting antibodies to those viruses)

The Red Cross led the investigations and clinical trials to support development of many of these tests and was among the first to implement them.

The Holland Laboratory was created in 1987 to house Red Cross research and development, particularly in transmissible diseases, plasma proteins and transplantation. Several supporting laboratories were also established at this same time that provided more specific testing of blood products. The Holland Laboratory continues to lead the Nation in the study of diseases that affect blood safety and in developing better ways to collect, process, store and distribute blood products.

The 1990s – Expanding Regulations and Transformation of Red Cross Services

As a result of the HIV crisis of the 1980s, the FDA began to exercise broader regulatory oversight of the blood banking industry. In response, blood banking organizations made several changes to their operations to model them after the pharmaceutical industry. More sophisticated computer systems and manufacturing practices were introduced to ensure the safety, quality, integrity, purity and potency of blood products.

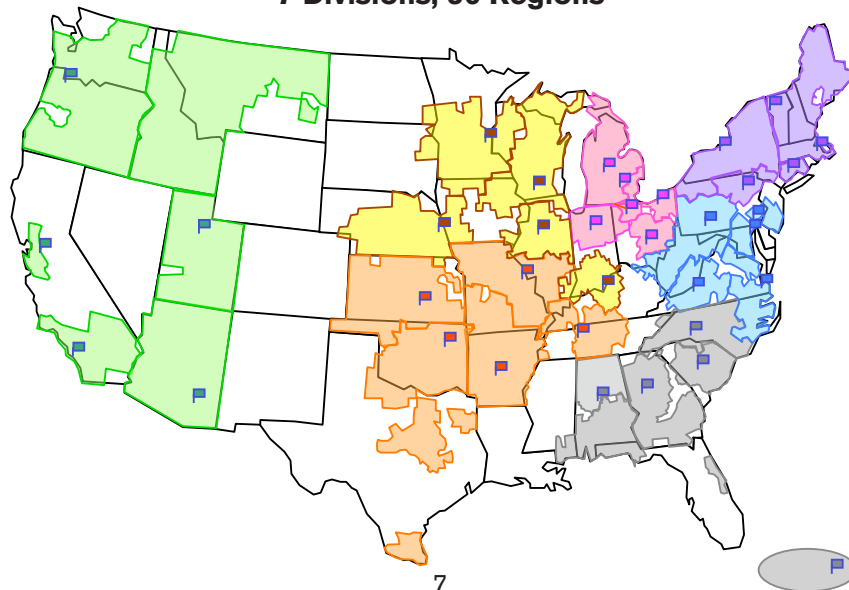
To carry out these changes, the Red Cross re-engineered its blood services operations. Prior to this time, blood banking operations were overseen by individual Red Cross chapters. This re-engineering, known as Transformation, separated the blood collection activities from other services conducted by the Red Cross (e.g., disaster relief, health and safety training and service to the military). It set up a dedicated cadre of blood banking professionals to run the different Red Cross blood regions. Additionally, National Headquarters began to exert more oversight, and Red Cross began the process of centralizing and standardizing operations across the system.

2000-Present – Nation’s Leading Supplier of Blood

Today, the Red Cross is the largest single supplier of blood and blood products in the U.S., including red blood cells, platelets, cryoprecipitate, and frozen plasma, which are distributed to some 3,000 hospitals and transfusion centers nationwide. Red Cross collections represent more than 40% of the U.S. blood supply. The other portion is collected by approximately 70 non-Red Cross community blood centers and several hundred hospital blood banks.

The Red Cross is organized into 7 Divisions, 36 blood regions and five testing laboratories. It collects 6.5 million units of blood from 4.5 million donors, and these collections result in 9.5M blood products.

Biomedical Services Map 7 Divisions, 36 Regions



A Leader in Research and Testing

In addition to being the single largest supplier of blood in the U.S., the Red Cross also plays a leading role in protecting the safety of the blood supply. The Red Cross has been among the first to develop and implement testing for many infectious diseases. It is frequently the single major contributor to clinical trials to establish the effectiveness of a new infectious disease test or improvement to an existing test.

Red Cross Firsts in Testing:

- First blood banking organization to evaluate all of the “first generation” tests for HIV
- First to use tests to confirm antibody tests for HIV were accurate (confirmatory testing)
- Worked with Centers for Disease Control and Prevention (CDC) to model the time difference between when donors become infected with HIV, and the time when HIV tests could detect antibodies in these potential blood donors (the “window period” risk model)
- First to implement nucleic acid tests for HIV and Hepatitis C virus
- First to work on Human T-lymphotropic virus (HTLV-I), a virus distantly related to HIV that causes a rare leukemia and a neurologic disease
- Collaborated with CDC on studies that found West Nile virus (WNV) was transfusion- transmitted. Currently, there have been nine known cases of transmission of WNV, none of which were due to Red Cross blood and all of which would have been preventable by appropriate use of procedures pioneered by the Red Cross
- Instrumental in producing the data required by FDA for test kit licensure for Chagas disease, a parasitic disease occurring in Latin America but present in the US.

Red Cross Hemovigilance Program

In addition to testing blood, the Red Cross has also implemented a first-of-its kind program examining donor and patient reactions to blood donations. In 2003, the Red Cross Medical Office instituted a nationwide hemovigilance program to investigate donor and recipient adverse events. The data from this effort has been used to move the Red Cross, and the entire blood industry, toward safer transfusions through changes in practices and procedures.

For example, data on Transfusion-Related Acute Lung Injury (TRALI) helped motivate the industry to implement transfusion of predominantly male-donated plasma in the U.S., a change predicted to prevent at least six deaths each year. Using male-donated plasma, instead of female plasma, reduces the risk of adverse reactions in patients who may be impacted by certain antibodies produced by women during or after pregnancy.

The program also led to improvements in bacterial safety of platelet components. This resulted in improved standards for collection and increased detection of contamination, leading to a decrease in the number of septic transfusion reactions reported each year.

The Red Cross Medical Office provides ongoing medical oversight to policy and procedure development. More recently, the Red Cross published an article in *The Journal of the American Medical Association (JAMA)* that became the impetus for an industry-wide collaboration to address safety of blood donation by high school-aged donors.

Role in Policies and Standards for the Industry

In addition to being a leader in research, the Red Cross experts play an important role in policies and standards for the industry. By serving on key committees of AABB and other blood-related organizations, and working closely with FDA, the Red Cross provides valuable data and expertise that influences the direction of blood banking. Red Cross experts are recognized as resources in all areas of blood banking, including quality and regulatory issues.

Working to Ensure an Adequate Blood Supply

The Red Cross has also made important improvements in the ability to collect more blood by:

- Better educating potential donors about healthy habits that decrease their likelihood of deferral for reasons such as low hemoglobin (anemia)
- Improving the “yield” from platelet donors to as many as three platelet doses per donation (such products are often used for cancer patients)
- Managing equipment better through a new software application that gives the Red Cross visibility into all of its equipment to ensure that it is being properly maintained. This reduces the risk that blood may have to be recalled because it was processed on a device that may have been defective
- Using containers that extend the time that blood can be safely shipped, thus improving the supply available to hospitals

Diverse Blood Donor Recruitment

The American Red Cross recognizes that the future of our Nation’s blood supply depends on our ability to sustain a supply of diverse blood donors. In an effort to raise awareness in minority communities and increase blood collections, the Red Cross has implemented recruitment initiatives in various parts of the country.

Red Cross Blood Regions have specific staff whose main focus is to communicate with and recruit donors from diverse donor groups. For example, in the Penn-Jersey region, three community outreach specialists work to increase blood donations from people of Asian, African-American and Hispanic descent.

Some of these initiatives include partnering with groups such as the Sickle Cell Disease Association, places of worship within communities, and targeted media outlets such as Telemundo, which sponsor numerous blood drives and donate air time.

Examples include:

- The Charles Drew program in the Missouri-Illinois region matches blood donors with patients who have sickle cell disease. In January 2009, the program celebrated its 10th year and is currently serving more than 100 sickle cell patients. In Baltimore, MD, Red Cross partners with the Sickle Cell Disease Association and invites speakers with the disease to share their story with African-American audiences.
- In Atlanta, African-American business and community leaders spearhead blood collections from African-American donors and raise awareness of the need for blood within their community.
- Red Cross works with the Miss Taiwan Foundation to encourage blood donations from people of Chinese and Taiwanese descent.

- The Southern California region developed the Mejorando Su Vida (Improving Your Life) campaign in partnership with Telemundo, Hoy newspaper and LaRaza radio. In its first year, it drew hundreds of Latino participants resulting in hundreds of units of blood collected.

Finding Rare Blood Donors

The Red Cross works to find rare blood donors to meet the specialized needs of patients all over the country.

It operates 39 Immunohematology Reference Laboratories (IRL) that offer specialized services and provide support to hospitals to ensure rare blood products are available whenever needed. More than 300 trained and certified Red Cross Medical Technologists work to meet the specialized transfusion needs of patients and are in direct contact with hospitals 24 hours a day, seven days a week, 365 days a year.

The American Rare Donor Program is a collaboration of AABB and American Red Cross IRLs. If a patient's life depends on finding a rare blood product, the American Red Cross works with the American Rare Donor Program to find a suitable match from among the 35,000 donors registered with the program. These IRLs collaborate to get the rare product from one part of the country to another. The search for the right donor most often occurs within the United States; however, in rare circumstances, the donor may come from another country. There are 81 American Rare Donor Program IRLs nationwide and the program is managed by the American Red Cross National Reference Laboratory for Blood Group Serology in Philadelphia, Pennsylvania.

Protecting the Safety of Donors and Patients

The Nation's blood supply is safer today than it has ever been, and Red Cross blood is considered among the safest in the world. While that does not mean there is no risk from blood, it does mean that US providers of blood, including the Red Cross, have greatly improved the safety of the US blood supply, particularly over the last 20 years.

In general, it is widely understood - by medical professionals and patients alike - that the benefits of blood, in saving lives and reducing the toll of illness and disease greatly outweigh its risks for most patients. All blood donated to the Red Cross is from voluntary donors, and the Red Cross encourages donations from all people eligible to give.

What causes risk from blood? First, blood - no matter how carefully collected, tested, and handled - very occasionally causes reactions in some patients.

Second, some infections in donors' blood cannot be tested for, either because no suitable test has yet been developed, or because the donor's infection is at too early a stage to be detected. There is a time called the "window period" when early after infection the disease agent is present in the bloodstream, but at too low a level to be detected. Continuous improvement in test technologies has helped reduce the window period, and this risk continues to decline.

Third, although donor questioning (about past travel, sexual activity, use of certain drugs, and other risk factors) can elicit much information about potential risk of blood from that donor, there is no set of questions that would identify every possible risk.

Fourth, much of blood banking today is still a highly manual process. As such, it is subject to human error. The Red Cross, like other blood banks, is determined to reduce to an absolute minimum both the number and the seriousness of such errors, but because much of the work must be done manually, it will almost certainly never reduce errors to zero.

Red Cross Layers of Safety

To reduce the risk to both donors and patients, the Red Cross has put in place multiple layers of safety. From the moment a potential blood donor walks into a Red Cross blood donation center, until the blood is shipped to hospitals and patients are monitored for adverse reactions, a sequence of steps are performed to ensure the safety of the blood donor and the patients who receive blood.

- A comprehensive screening of the donor’s medical history is performed, and the donor is checked against a “deferral registry” to see if they are ineligible to donate. This includes questions about medications, travel in areas of disease risk (e.g. malaria risk), past infections, sexual behaviors and drug use.
- A short physical exam is given, including a check of blood pressure, temperature, pulse and anemia (hemoglobin test) to ensure the donor is eligible to give blood.
- Blood is tested in one of five Red Cross state-of-the-art testing laboratories where trained technologists perform up to 12 different tests on samples from each unit. Every unit of blood is screened for infectious diseases including HIV, syphilis, and hepatitis B and C viruses, human T-cell lymphotropic virus, West Nile virus and the agent of Chagas disease.
- Blood is quarantined until results of tests are finalized.
- After distribution to hospitals, the Red Cross continually monitors and investigates any reported adverse reactions.

Many of these systems have overlapping effects or are redundant. All of these activities are managed under rigorous quality systems and are stringently regulated by the FDA.

There continues to be concern about the risk offered by additional emerging infections, and the Red Cross is currently engaged in active research on a number of potential sources of risk including malaria, babesiosis, dengue and influenza.

Coordinating with the FDA to Improve Blood Safety

The Red Cross’ top priority is the safety of the blood it supplies. For the reasons discussed above, the blood supply will never be 100% safe, but the Red Cross is committed to making it as safe as it can possibly be.

While there is no data available to compare the overall success of individual blood banks, there is data to show that the Red Cross has a proportionately lower percentage of recall events when compared to the rest of the industry. A recall is where product that may not conform to safety standards is removed from the market.

The Red Cross works continuously to improve blood safety by:

- Creating a culture where everyone in the organization understands blood safety is the highest priority and reinforcing that with better training, increased supervision and accountability
- Complying with Federal and State laws and regulations that set standards for operating blood banks, laboratories, and other facilities at which donors give blood, and where blood is prepared for distribution to hospitals and patients
- Coordinating with the FDA, which regulates blood and the operations of blood banks, to achieve sustained compliance with an Amended Consent Decree which prescribes detailed standards for Red Cross operations

History of Red Cross and FDA Compliance

In 1988, after several FDA inspections of Red Cross blood centers raised questions about inconsistencies across regions in the Red Cross' performance, the Red Cross and FDA negotiated a Voluntary Agreement under which the Red Cross agreed to specific steps to centralize its biomedical operations. However, FDA remained dissatisfied with the Red Cross' performance, and in 1992 the Red Cross and FDA discussed replacing the 1988 Voluntary Agreement with a court-ordered Consent Decree.

When the Red Cross and FDA agreed on the terms of a Consent Decree, the Decree was formalized by a Court order in 1993. The Decree required the Red Cross to take corrective action in areas such as management controls, quality controls and employee training as means of improving its performance.

The Red Cross was successful in resolving compliance issues, and inspection patterns showed substantial compliance through the mid-1990s. By 1998, the Red Cross and FDA had begun to discuss the possibility of filing a joint motion to withdraw the Consent Decree. But in 1999, FDA issued a 25-item "FDA 483" (a post-inspection document identifying areas of needed improvement) that raised issues concerning operations at the Red Cross Blood Center in Atlanta and National Headquarters oversight functions.

In 2000, FDA issued a 63-item FDA 483 inspection report. In August of that year, the FDA notified the Red Cross of its intent to seek an amended Consent Decree that would impose new requirements and financial penalties. In response, the Red Cross sought the court's review of FDA's decision to amend the Consent Decree and sought mediation to resolve the dispute with the FDA. In 2003, after a series of negotiations, the Red Cross and FDA agreed to an Amended Consent Decree. It imposes detailed operating requirements and stringent reporting requirements on the Red Cross and imposes financial penalties for non-compliance with laws, FDA regulations, and Red Cross standard operating procedures.

Steps Taken to Improve FDA Compliance

To improve its performance in accordance with the applicable law and the Amended Consent Decree, the Red Cross has implemented system-wide changes to its operations. Three keys to this effort are:

1. **Biomedical Services Compliance Plan** – a comprehensive plan with specific action steps to help achieve sustained compliance
2. **Standardization** – a vigorous effort to help ensure Red Cross blood services operate in the same way in every location
3. **Technology and Process improvements** – introduction of new technologies and systems to reduce the potential for human error

Biomedical Services Compliance Plan

In April 2008, the Board of Governors of the American Red Cross approved a comprehensive Compliance Plan that placed continuing focus on:

- Creating a culture of compliance with Standard Operating Procedures, the applicable law, and the Amended Consent Decree
- Making sure auditing functions rigorously measure the effectiveness of Red Cross programs and point out problems, gaps, and areas where improvement is needed

- Identifying and remedying problems as quickly and efficiently as possible
- Educating and training employees and volunteers whose jobs have or could have an impact on the quality and safety of Red Cross blood products
- Rewarding employees and volunteers whose day-to-day and long-term efforts contribute to success
- Establishing enforcement and disciplinary standards designed to ensure that employees and volunteers take seriously their compliance responsibilities

Biomedical Services maintains a close working relationship with the FDA, and its senior officials and other Red Cross officials meet with FDA regularly to assess progress under the Amended Consent Decree.

Standardization

Instead of operating as 36 separate and autonomous units, Biomedical Services is moving rapidly to operate as one system.

- Work has begun to standardize collections, donor management and manufacturing activities and a standard organizational structure for the seven Red Cross Divisions.
- Job descriptions are being standardized to ensure requisite skill sets for specific responsibilities.
- A functional model of operation is being adopted whereby Human Resources, IT, Finance, Manufacturing, Hospital Services, Inventory Management, Donor Management, and Testing are now overseen by one entity for the entire system. This allows a single entity the ability and authority to require changes that are standard within a functional area.

Standardization is allowing the Red Cross to make changes more rapidly, achieve and monitor compliance more easily, reduce costs so more funds can be invested in technologies to reduce human error and align the organization to focus on key priorities.

Technology and Process Improvements

A third way the Red Cross is working to continuously improve its blood banking operations is through its focus on technology and process improvements. Much of blood banking today is still a highly manual process, increasing the risk of human error. Introducing new technologies and simplified procedures and processes can often dramatically reduce the number of problems that occur.

For example, implementation of an electronic Blood Donation Record (eBDR) helped reduce errors in collecting information from blood donors by 50 percent since 2006.

Measurable Progress in Improving Blood Safety

As a result of Red Cross efforts to continuously improve safety, and the staff's enthusiastic and determined response to this challenge, the number of problems has been dramatically reduced and the Red Cross has achieved levels of human performance that are high for manual process activities.

Because of these renewed efforts to improve our systems, between July 2006 and November 2008 the Red Cross has demonstrated the following improvements:

- 52% reduction in overall problems
- 64% reduction in laboratory testing issues
- 28% reduction in recalls
- 68% reduction in storage, shipping and return issues
- 78% reduction in blood collection time and documentation issues

Has the Red Cross reduced problems to zero? No, because there will always be human error. But the Red Cross is much closer to that goal, and will continue to strive to get closer and closer.

A Commitment to America's Blood Donors and Patients

America depends on the Red Cross to ensure a safe and adequate blood supply for the Nation, and the Red Cross is committed to meeting that responsibility.

As a leader in the blood banking industry, the Red Cross has pioneered state-of-the-art testing to advance the safety of blood donors and patients. It will continue to lead the way in testing because this research helps save lives and results in a safer blood supply.

The Red Cross is also committed to sustained effort to reduce problems with the blood supply to an absolute minimum. While it has made significant progress in reducing problems, the Red Cross recognizes that there is more work to do, and it will continue to focus on this effort as its top priority.

Finally, the Red Cross is committed to the health and safety of every blood donor who volunteers to roll up their sleeve and every patient who receives blood. We appreciate all those who support the life-saving mission of the American Red Cross by donating blood.