PLASMA PROTEIN THERAPIES
Uniquely Saving Lives

PPTA
Plasma Protein Therapeutics Association
About PPTA

The Plasma Protein Therapeutics Association is a 501(c)(6) non-profit trade association that represents plasma donation centers as well as plasma protein therapy manufacturers. Our mission is to promote the availability of and access to safe and effective plasma protein therapeutics for all patients in the world.

PPTA works to advocate for access to and affordability of therapies for patients, engage in constructive dialogue with regulatory agencies, and collaborate with patient advocacy organizations.

FOR MORE INFORMATION, PLEASE VISIT: WWW.PPTAGLOBAL.ORG

Standards & Programs

PPTA also administers standards and programs that help ensure the quality and safety of plasma collection and manufacturing and protect both donors and patients.

» International Quality Plasma Program (IQPP)

» Quality Standards of Excellence, Assurance and Leadership (QSEAL)

» National Donor Deferral Registry (NDDR)

» Patient Notification System (PNS)

» North America Data Program
Treating Rare Diseases

Plasma protein therapies are unique biologic medicines that treat plasma protein deficiencies by replacing a person's missing or functionally damaged proteins. In the United States, a disease is considered rare if it affects fewer than 200,000 individuals. Plasma protein deficiencies have very small patient populations and can be considered extremely rare.

Patients Treated with Plasma Protein Therapies in the U.S.

<table>
<thead>
<tr>
<th>CAUSES &amp; SYMPTOMS</th>
<th>U.S. PATIENTS TREATED ANNUALLY (ESTIMATES)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRIMARY IMMUNODEFICIENCY DISEASES</strong></td>
<td></td>
</tr>
<tr>
<td>• Caused by missing immunoglobulins (antibodies)</td>
<td>40,000</td>
</tr>
<tr>
<td>• Antibodies control the immune system and prevent illness</td>
<td></td>
</tr>
<tr>
<td>• Patients are chronically ill from severe, persistent, recurrent infections</td>
<td></td>
</tr>
<tr>
<td><strong>CHRONIC INFLAMMATORY DEMYELINATING POLYNEUROPATHY</strong></td>
<td></td>
</tr>
<tr>
<td>• Cause not certain; immune system attacks nerve coating</td>
<td>14,000</td>
</tr>
<tr>
<td>• Messages from the brain aren’t delivered to the body if nerve coating is damaged</td>
<td></td>
</tr>
<tr>
<td>• Patients experience progressive weakness, loss of limb function, and disability</td>
<td></td>
</tr>
<tr>
<td><strong>BLEEDING DISORDERS (E.G. HEMOPHILIA)</strong></td>
<td></td>
</tr>
<tr>
<td>• Caused by missing clotting factor protein</td>
<td>30,000</td>
</tr>
<tr>
<td>• Clotting factors control bleeding</td>
<td>includes recombinant therapies</td>
</tr>
<tr>
<td>• Patients cannot regulate bleeding</td>
<td></td>
</tr>
<tr>
<td>• Can be fatal if bleeding occurs in brain or vital organs</td>
<td></td>
</tr>
<tr>
<td><strong>HEREDITARY ANGIOEDEMA</strong></td>
<td></td>
</tr>
<tr>
<td>• Caused by missing C1 esterase inhibitor protein (C1-INH)</td>
<td>5,000</td>
</tr>
<tr>
<td>• C1-INH helps regulate inflammation</td>
<td></td>
</tr>
<tr>
<td>• Patients have edema (severe swelling)</td>
<td></td>
</tr>
<tr>
<td>• Can be fatal if airway obstructed</td>
<td></td>
</tr>
<tr>
<td><strong>ALPHA-1 ANITRYPSEIN DEFICIENCY</strong></td>
<td></td>
</tr>
<tr>
<td>• Caused by missing Alpha-1 Proteinase Inhibitor</td>
<td>7,500</td>
</tr>
<tr>
<td>• Alpha-1 Proteinase Inhibitor protects the lungs</td>
<td></td>
</tr>
<tr>
<td>• Patients have chronic emphysema and liver damage</td>
<td></td>
</tr>
</tbody>
</table>

1. American Thrombosis & Hemostasis Network
Plasma Protein Therapies: Uniquely Saving Lives

Made From Plasma

**Donated Plasma Is A Finite Starting Material**

The starting material for plasma protein therapies is not an infinite resource. Rather than using synthetic or chemical ingredients, plasma protein therapies are made using human plasma. *Plasma cannot be made in a laboratory.* Plasma and its life-saving proteins can only be obtained from donors who so generously give their time to donate.

**Licensure**

The Food & Drug Administration (FDA) approves medicines for safety & efficacy before they can be sold in the U.S. *Plasma protein therapies are the only medicines for which the starting material must also be licensed.* In addition to the final products, the FDA qualifies and approves plasma before it can be used for manufacturing.

**Plasma Collection**

Plasma is collected from healthy, compensated donors through a process called plasmapheresis. Plasmapheresis removes a donor’s plasma and returns the remaining blood components.

Plasma is collected at 550+ plasma donation centers in the U.S. After collection, the plasma donation is frozen and shipped to a state-of-the-art facility for manufacture into life-saving plasma protein therapies.

EVERY YEAR IT TAKES APPROXIMATELY:

- **130:** Plasma donations to treat ONE PATIENT with a PRIMARY IMMUNODEFICIENCY DISEASE.
- **900:** Plasma donations to treat ONE PATIENT with an ALPHA-1 ANTITRYSIN DEFICIENCY.
- **1200:** Plasma donations to treat ONE PATIENT with HEMOPHILIA.
Plasma protein therapies require constant vigilance for safe products. There are three types of safeguard measures used in plasma donation and manufacturing to ensure safe plasma protein therapies:

Voluntary industry standards often exceed regulatory requirements.

Current manufacturing protocols are extremely effective against pathogens. The industry has a record of safety from pathogens for more than 20 years.

Evolving Protocols
Unlike traditional pharmaceuticals or other biologics where standard quality assurance practices are sufficient, plasma protein therapies’ safety protocols are constantly evolving due to new and emerging pathogens.

Companies must continuously perform tests to demonstrate that their viral inactivation and removal steps work on new pathogens. Most recently, companies invested significant time and resources into researching the Zika virus to ensure it does not threaten the safety of plasma protein therapies.
Plasma Protein Therapies: Uniquely Saving Lives

Complex Manufacturing

Plasma Protein Therapies are Highly Complex to Manufacture

Plasma protein therapies take 7-12 MONTHS to manufacture. Companies must adhere to rigorous regulatory requirements to ensure manufacturing consistency and pathogen safety.

COSTS ATTRIBUTED TO MANUFACTURING & RAW MATERIALS

<table>
<thead>
<tr>
<th>Pharmaceuticals</th>
<th>Plasma Proteins</th>
</tr>
</thead>
<tbody>
<tr>
<td>14%</td>
<td>57%</td>
</tr>
</tbody>
</table>

* Source: Marketing Research Bureau
Value to Patients

As different policies to slow health spending are debated, it is critical to maintain access to life-saving treatments for rare disease patients. Although some value-based frameworks work for generic, interchangeable pharmaceuticals—a one-size-fits-all policy does not work for plasma protein therapies as these biologics are not interchangeable.

Plasma protein therapies are high-impact pharmaceuticals because they increase life expectancy, improve quality of life, and reduce life-threatening complications for individuals with plasma protein deficiencies.

Plasma protein therapies provide immeasurable, lifelong benefits to the patients who use them.

**10-year survival rate of patients with COMMON VARIABLE IMMUNE DEFICIENCY, by year**

<table>
<thead>
<tr>
<th>Year</th>
<th>Survival Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>90%</td>
</tr>
<tr>
<td>1993</td>
<td>78%</td>
</tr>
<tr>
<td>1971</td>
<td>37%</td>
</tr>
</tbody>
</table>


**Life expectancy of a patient born with HEMOPHILIA, by year**

<table>
<thead>
<tr>
<th>Year</th>
<th>Life Expectancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>77 years</td>
</tr>
<tr>
<td>1960</td>
<td>13 years</td>
</tr>
<tr>
<td>1900</td>
<td>20 years</td>
</tr>
</tbody>
</table>


**Value to Patients**

“Plasma-derived therapies saved my children’s lives, literally. The first thing that would happen if we didn’t have access to them would be that we would not be able to stop bleeding inside their bodies, they would first be in a lot of pain, then they would become crippled and eventually they would die.”

- Kerry, mother of sons with hemophilia

**Value to the System**

The economic impact of diagnosing a Primary Immunodeficiency Disease and treating an individual with immunoglobulin therapy represents an average savings of $55,882 per year.

Non-Interchangeable & Unique

One-size-fits-all policies are unsuitable for plasma protein therapies and endanger patient health. Each therapy is unique due to the pharmacologic and manufacturing differences that exist across different brands and patients’ unique response to the treatments. Plasma protein therapies are non-interchangeable, sole-source biologics, therefore it is essential that patients have access to their medically justifiable therapy.

Expert Clinical Guidelines on Non-Interchangeability

“Given the variable nature of these diseases, individualized treatments depending on patient need and physician judgment are important.”

“It is unacceptable to limit availability of augmentation therapy in any way and especially to a single product.”

“IVIG is not a generic drug and IVIG products are not interchangeable. A specific IVIG product needs to be matched to patient characteristics to insure patient safety.”

“Because not all patients respond the same to each medication, it is the responsibility of the coordinating expert physician to work with each patient to define the optimal medication(s) for that particular patient.”

“It is critical that the bleeding disorder community has access to a diverse range of therapies and that prescriptions for specific clotting factor concentrates are respected and reimbursed.”

1. Alpha-1 Foundation Medical and Scientific Advisory Committee Clinical Practice Guidelines
2. American Academy of Allergy Asthma & Immunology Principle #8
3. American Academy of Neurology Therapeutics & Technology Assessment Subcommittee Evidence-based Guidelines
4. US HAEA Medical Advisory Board Recommendations
5. NHF Medical and Scientific Advisory Council Recommendation #159
Source Members in North America
Access Plasma LLC
ADMA Biologics
B Positive National Blood Services LLC
BioLife Plasma Services LP/Shire Biotest Pharmaceuticals
Blood and Plasma Research Inc.
BPL Plasma Inc.
CSL Plasma
GCAM Inc.
Grifols Plasma
Immunotek Bio Centers LLC
The Interstate Companies
Kedrion SpA
Octapharma Plasma
ProMetic Plasma Resources
Scantibodies Biologics
Southern Blood Services

Employment
Each plasma donation center employs between 50 - 100 people.

Local Economies
On average, each plasma donation center puts $2 million into the community in donor compensation.

Strength in Numbers
There are more than 35 million plasma donations annually in the U.S.

Repeat Engagement
The average donor donates 21 times per year.

550 AND COUNTING!
There are more than 550 plasma donation centers in the United States.

*Includes manufacturing plants, testing laboratories, research facilities, logistics and distribution centers, and corporate offices.