## Managing Common Infusion Issues

<table>
<thead>
<tr>
<th>Local Reaction</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Assess for tape allergy—change to paper/hypoallergenic tape</td>
<td></td>
</tr>
<tr>
<td>• Assess needle gauge—choose a needle that is consistent with volume being infused</td>
<td></td>
</tr>
<tr>
<td>• Assess length of needle—may be too short and infusion may be intradermal</td>
<td></td>
</tr>
<tr>
<td>• Assess site location—may not be penetrating subcutaneous tissue</td>
<td></td>
</tr>
<tr>
<td>• Choose sites with appropriate amount of subcutaneous tissue</td>
<td></td>
</tr>
<tr>
<td>• Avoid tracking IgG through intradermal tissue by not allowing drops of IgG on needle tip prior to needle insertion (prime dry)</td>
<td></td>
</tr>
<tr>
<td>• Assess appropriateness of rotating sites based on previous tolerability</td>
<td></td>
</tr>
<tr>
<td>• Consider use of topical anesthetic ointment</td>
<td></td>
</tr>
<tr>
<td>• Avoid infusion into areas where the skin is tender, bruised, red, or hard. Avoid infusing into scars, stretch marks, or tattooed skin</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Leaking at Infusion Site</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Assess needle and catheter—ensure they are affixed securely and fully inserted</td>
<td></td>
</tr>
<tr>
<td>• Assess placement—may be in location that is subject to movement; advise regarding selection of site</td>
<td></td>
</tr>
<tr>
<td>• Assess length of subcutaneous needle—may be too short; suggest change</td>
<td></td>
</tr>
<tr>
<td>• Assess rate of infusion volume—amount per site may be too great; adjust volume</td>
<td></td>
</tr>
<tr>
<td>• Assess rate of infusion—adjust rate (rate may be too fast)</td>
<td></td>
</tr>
</tbody>
</table>

(continued on next page)
### Managing Common Infusion Issues¹ (continued)

<table>
<thead>
<tr>
<th>Discomfort With Needle</th>
<th>Infusion Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Assess needle length—may be too long and irritating to the infusion site</td>
<td>• Assess product storage—Hizentra is ready to use at room temperature; no refrigeration required</td>
</tr>
<tr>
<td>• Try catheter that allows introducer needle to be removed or try another brand of SC Ig set</td>
<td>• Assess volume per site, rate of infusion, and number of sites, or adjust infusion regimen</td>
</tr>
<tr>
<td>• Consider applying cold pack or topical anesthetic cream prior to insertion</td>
<td>• Check manufacturer’s instructions for pump setting, correct selection of tubing size and length to match infusion rates; check pump function, battery function, etc</td>
</tr>
<tr>
<td></td>
<td>• Arrange observation of patient technique (specialty pharmacy provider or office visit)</td>
</tr>
</tbody>
</table>

HIGHLIGHTS OF PRESCRIBING INFORMATION
These highlights do not include all the information needed to use HIZENTRA safely and effectively. See full prescribing information for HIZENTRA.

HIZENTRA, Immune Globulin Subcutaneous (Human), 20% Liquid
Initial U.S. Approval: 2010

WARNING: THROMBOSIS
See full prescribing information for complete boxed warning.

- Thrombosis may occur with immune globulin products, including HIZENTRA. Risk factors may include: advanced age, prolonged immobilization, hypercoagulable conditions, history of venous or arterial thrombosis, use of estrogens, indwelling vascular catheters, hypeerviscosity, and cardiovascular risk factors.
- For patients at risk of thrombosis, administer HIZENTRA at the minimum dose and infusion rate practicable. Ensure adequate hydration in patients before administration. Monitor for signs and symptoms of thrombosis and assess blood viscosity in patients at risk for hyperviscosity.

<table>
<thead>
<tr>
<th>Parameters*</th>
<th>1st Infusion</th>
<th>Subsequent Infusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume (mL/site)</td>
<td>≤ 15</td>
<td>≤ 25</td>
</tr>
<tr>
<td>Rate (mL/hr/site)</td>
<td>≤ 15</td>
<td>≤ 25</td>
</tr>
</tbody>
</table>

As tolerated

ADDITIONAL DOSAGE FORMS AND STRENGTHS
0.2 g per mL (20%) protein solution for subcutaneous infusion.

CONTRAINdications
- Anaphylactic or severe systemic reaction to human immune globulin or inactive ingredients of HIZENTRA, such as polysorbate 80. (4)
- Hyperprolinemia Type I or II (HIZENTRA contains stabilizer L-proline). (4)
- IgA-deficient patients with antibodies against IgA and a history of hypersensitivity. (4)

WARNINGS AND PRECAUTIONS
- IgA-deficient patients with anti-IgA antibodies are at greater risk of severe hypersensitivity and anaphylactic reactions. (5.1)
- Thrombosis may occur following treatment with immune globulin products, including HIZENTRA. (5.2)
- Aseptic meningitis syndrome has been reported with IGIV or IGSC, including HIZENTRA treatment. (5.3)
- Monitor renal function, including blood urea nitrogen, serum creatinine, and urine output in patients at risk of acute renal failure. (5.4)
- Monitor for clinical signs and symptoms of hemolysis. (5.5)
- Monitor for pulmonary adverse reactions (transfusion-related acute lung injury [TRALI]). (5.6)
- HIZENTRA is made from human blood and may contain infectious agents, e.g., viruses, the variant Creutzfeldt-Jakob disease (vCJD) agent and, theoretically, the Creutzfeldt-Jakob disease (CJD) agent. (5.7)

ADVERSE REACTIONS
The most common adverse reactions observed in ≥5% of study subjects were local infusion site reactions, headache, diarrhea, fatigue, back pain, nausea, pain in extremity, cough, upper respiratory tract infection, rash, pruritus, vomiting, abdominal pain (upper), migraine, arthralgia, pain, fall and nasopharyngitis. (6)

To report SUSPECTED ADVERSE REACTIONS, contact CSL Behring Pharmacovigilance at 1-866-915-6958 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

DRUG INTERACTIONS
The passive transfer of antibodies may interfere with the response to live virus vaccines (7.1), and lead to misinterpretation of the results of serological testing. (5.8, 7.2)

See 17 for PATIENT COUNSELING INFORMATION and FDA-approved patient labeling.

Revised: March 2018

7 DRUG INTERACTIONS
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7.2 Serological Testing
8 USE IN SPECIFIC POPULATIONS
8.1 Pregnancy
8.2 Lactation
8.4 Pediatric Use
8.5 Geriatric Use
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12 CLINICAL PHARMACOLOGY
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13 NONCLINICAL TOXICOLOGY
13.2 Animal Toxicology and/or Pharmacology
14 CLINICAL STUDIES
14.1 Primary Immunodeficiency (PI)
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15 REFERENCES
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* Sections or subsections omitted from the full prescribing information are not listed.
Hizentra® Immune Globulin Subcutaneous (Human) (IGSC), 20% Liquid

FULL PRESCRIBING INFORMATION

WARNING: THROMBOSIS
- Thrombosis may occur with immune globulin products13, including HIZENTRA. Risk factors may include: advanced age, prolonged immobilization, hypercoagulable conditions, history of venous or arterial thrombosis, use of estrogens, indwelling central vascular catheters, hyperviscosity, and cardiovascular risk factors. Thrombosis may occur in the absence of known risk factors [see Warnings and Precautions (5.2), and Patient Counseling Information (17)].
- For patients at risk of thrombosis, administer HIZENTRA at the minimum dose and infusion rate practicable. Ensure adequate hydration in patients before administration. Monitor for signs and symptoms of thrombosis and assess blood viscosity in patients at risk for hyperviscosity [see Warnings and Precautions (5.2)].

1 INDICATIONS AND USAGE
HIZENTRA is an Immune Globulin Subcutaneous (Human) (IGSC), 20% Liquid indicated for the treatment of the following conditions:

1.1 Primary Immunodeficiency (PI)
HIZENTRA is indicated as a replacement therapy for primary humoral immunodeficiency (PI) in adults and pediatric patients 2 years of age and older. This includes, but is not limited to, the humoral immune defect in congenital agammaglobulinemia, common variable immunodeficiency, X-linked agammaglobulinemia, Wiskott-Aldrich syndrome, and severe combined immunodeficiencies.

1.2 Chronic Inflammatory Demyelinating Polyneuropathy (CIDP)
HIZENTRA is indicated for the treatment of adult patients with chronic inflammatory demyelinating polyneuropathy (CIDP) as maintenance therapy to prevent relapse of neuromuscular disability and impairment.

Limitations of Use:
HIZENTRA maintenance therapy in CIDP has been systematically studied for 6 months and for a further 12 months in a follow-up study. Maintenance therapy beyond these periods should be individualized based upon the patient’s response and need for continued therapy [see Dosage and Administration (2)].

2 DOSAGE AND ADMINISTRATION
For subcutaneous infusion only.

2.1 Preparation and Handling
HIZENTRA is a clear and pale yellow to light brown solution. Do not use if the solution is cloudy or contains particulates.
- Prior to administration, visually inspect each vial of HIZENTRA for particulate matter or discoloration, whenever the solution and container permit.
- Do not freeze. Do not use any solution that has been frozen.
- Check the product expiration date on the vial label. Do not use beyond the expiration date.
- Do not mix HIZENTRA with other products.
- Do not shake the vial.
- Use aseptic technique when preparing and administering this product.
- The HIZENTRA vial is for single use only. Discard all used administration supplies and any unused product immediately after each infusion in accordance with local requirements.

2.2 Dose
Primary Immunodeficiency (PI)
- HIZENTRA can be administered at regular intervals from daily up to every 2 weeks (biweekly).
- Individualize the dose based on the patient’s clinical response to HIZENTRA therapy and serum immunoglobulin G (IgG) trough levels.
- Before receiving treatment with HIZENTRA:
  - Ensure that patients have received Immune Globulin Intravenous (Human) (IGIV) treatment at regular intervals for at least 3 months.
  - Obtain the patient’s serum IgG trough level to guide subsequent dose adjustments (see below; under Dose Adjustment).

Dosing for patients switching to HIZENTRA from IGIV
- Establish the initial weekly dose of HIZENTRA by converting the monthly IGIV dose into a weekly equivalent and increasing it using the dose adjustment factor. The goal is to achieve a systemic serum IgG exposure (area under the concentration-time curve [AUC]) not inferior to that of the previous IGIV treatment.
- To calculate the initial weekly dose of HIZENTRA, divide the previous IGIV dose in grams by the number of weeks between doses during the patient’s IGIV treatment (e.g., 3 or 4); then multiply this by the dose adjustment factor of 1.37 [see Clinical Pharmacology (12.3, Table 7)].
  - Initial HIZENTRA dose = Previous IGIV dose (in grams) x 1.37
  - Number of weeks between IGIV doses
- To convert the HIZENTRA dose (in grams) to milliliters (mL), multiply the calculated dose (in grams) by 5.
- Provided the total weekly dose is maintained, any dosing interval from daily up to biweekly can be used and will result in systemic serum IgG exposure that is comparable to the previous IGIV or weekly HIZENTRA treatment [see Clinical Pharmacology (12.3)].
- For biweekly dosing, multiply the calculated HIZENTRA weekly dose by 2.
- For frequent dosing (2 to 7 times per week), divide the calculated weekly dose by the desired number of times per week (e.g., for 3 times per week dosing, divide weekly dose by 3).

Dosage for patients switching to HIZENTRA from IGSC
- The previous weekly IGSC dose should be maintained.
- For biweekly dosing, multiply the previous weekly dose by 2.
- For frequent dosing (2 to 7 times per week), divide the previous weekly dose by the desired number of times per week (e.g., for 3 times per week dosing, divide weekly dose by 3).

Start HIZENTRA treatment
- For weekly or frequent dosing, start treatment with HIZENTRA 1 week after the patient’s last IGIV infusion or IGSC infusion.
- For biweekly dosing, start treatment 1 or 2 weeks after the last IGIV infusion or 1 week after the last IGSC infusion.

Dose Adjustment
The dose may need to be adjusted to achieve the desired clinical response and serum IgG trough level, irrespective of the frequency of administration. To determine if a dose adjustment should be considered, measure the patient’s serum IgG trough level. To evaluate a dose adjustment, measure subsequent trough levels. [See Clinical Pharmacology (12.3)].

Weekly dosing: When switching from IGIV to weekly HIZENTRA dosing, the target serum IgG trough level is projected to be approximately 16% higher than the last trough level during prior IGIV therapy [see Clinical Pharmacology (12.3)].

Biweekly dosing: When switching from IGIV to biweekly HIZENTRA dosing, the target serum IgG trough level is projected to be approximately 10% higher than the last IGIV trough level. When switching from weekly to biweekly dosing, the target trough is projected to be approximately 5% lower than the last trough level on weekly therapy [see Clinical Pharmacology (12.3)].

Frequent dosing: When switching from weekly dosing to more frequent dosing, the target serum IgG trough level is projected to be approximately 3 to 4% higher than the last trough level on weekly therapy [see Clinical Pharmacology (12.3)].

To adjust the dose based on serum trough levels, calculate the difference (in mg/dL) between the patient’s IgG trough level obtained 2 to 3 months following the switch from IGIV or the last IGSC dose adjustment and the target IgG trough level for weekly or biweekly dosing. Then find this difference in Table 1 (Column 1) and, based on the HIZENTRA dosing frequency (for weekly or biweekly) and the patient’s body weight, locate the corresponding adjustment amount (in mL) by which to increase (or decrease) the dose. For frequent dosing, add the weekly increment from Table 1 to the weekly-equivalent dose and then divide by the number of days of dosing.

Use the patient’s clinical response as the primary consideration in dose adjustment. Additional dosage increments may be indicated based on the patient’s clinical response (infection frequency and severity).

Table 1. Incremental Adjustment (mL)* of the HIZENTRA Dose* Based on the Difference (mg/dL) from the Target Serum IgG Trough Level

<table>
<thead>
<tr>
<th>Difference From Target Serum IgG Trough Level (mg/dL)</th>
<th>Dosing Frequency</th>
<th>Weight Adjusted Dose Increment (mL)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;10 to ≤30</td>
<td>Weekly†</td>
<td>n/a</td>
</tr>
<tr>
<td>&gt;30 to ≤50</td>
<td>Biweekly</td>
<td>5</td>
</tr>
<tr>
<td>&gt;50 to ≤70</td>
<td>Weekly†</td>
<td>2.5</td>
</tr>
<tr>
<td>&gt;70 to ≤90</td>
<td>Biweekly</td>
<td>5</td>
</tr>
<tr>
<td>&gt;90</td>
<td>200</td>
<td>10</td>
</tr>
</tbody>
</table>

* Incremental adjustments based on slopes of the pharmacometric model predicted relationship between serum IgG trough level and HIZENTRA dose increments of 1 mg/kg per week.
† Includes biweekly, weekly or frequent dosing.
‡ To determine the dose increment for frequent dosing, add the weekly increment to the weekly-equivalent dose and then divide by the number of days of dosing.

n/a, not applicable.
For example, if a patient with a body weight of 70 kg has an actual IgG trough level of 900 mg/dL and the target trough level is 1000 mg/dL, this results in a difference of 100 mg/dL. Therefore, increase the weekly dose of HIZENTRA by 10 mL. For biweekly dosing, increase the biweekly dose by 20 mL. For 2 times per week dosing, increase the dose by 50 mL/kg.

Monitor the patient’s clinical response, and repeat the dose adjustment as needed.

Dosage requirements for patients switching to HIZENTRA from another IGSC product: If a patient on HIZENTRA does not maintain an adequate clinical response or a serum IgG trough level equivalent to that of the previous IGSC treatment, the physician may want to adjust the dose. For such patients, Table 1 also provides guidance for dose adjustment if their desired IGSC trough level is known.

Table 1: Dosage requirements for patients switching to HIZENTRA from another IGSC product

<table>
<thead>
<tr>
<th>Dose Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>If CIDP symptoms worsen, consider re-initiating therapy with an IGIV approved for the treatment of CIDP, while discontinuing HIZENTRA.</td>
</tr>
<tr>
<td>- If improvement and stabilization are observed during IGIV treatment, consider re-initiating HIZENTRA at the dose of 0.4 g/kg body weight per week, administered in 2 sessions per week over 1 or 2 consecutive days.</td>
</tr>
<tr>
<td>- If CIDP symptoms worsen on the 0.4 g/kg body weight per week dose, consider re-initiating therapy with an IGIV product approved for treatment of CIDP, while discontinuing HIZENTRA.</td>
</tr>
</tbody>
</table>

Monitoring the patient’s clinical response and adjusting the dose are crucial for effective treatment. If CIDP symptoms worsen on the 0.4 g/kg body weight per week dose, consider re-initiating therapy with an IGIV product approved for treatment of CIDP, while discontinuing HIZENTRA.

Continued monitoring of the patient’s clinical response and adjusting the dose as needed are important to ensure the best possible outcomes. If improvement and stabilization are observed during IGIV treatment, consider re-initiating HIZENTRA at the dose of 0.4 g/kg body weight per week, administered in 2 sessions per week over 1 or 2 consecutive days.

Preparing for Subcutaneous Infusion

HIZENTRA is intended for subcutaneous administration using an infusion pump. Infuse HIZENTRA in the abdomen, thigh, upper arm, and/or lateral hip.

- Infusion sites – A HIZENTRA dose may be infused into multiple infusion sites. Use up to 8 infusion sites in parallel. More than one infusion device can be used simultaneously. Infusion sites should be at least 2 inches apart. Change the actual site of infusion with each administration.

- Volume (as tolerated) – For the first infusion of HIZENTRA, do not exceed a volume of 15 mL per infusion site in patients with PI or up to 20 mL per infusion site in patients with CIDP. For subsequent infusions, the volume may be increased to 25 mL per infusion site for patients with PI or to 50 mL per site for patients with CIDP.

- Rate (as tolerated) – For the first infusion of HIZENTRA, the recommended flow rate is up to 15 mL per hour per infusion site in patients with PI or up to 20 mL per hour per site in patients with CIDP. For subsequent infusions, the flow rate may be increased to 25 mL per hour per site in patients with PI or up to 50 mL per hour per site in patients with CIDP.

Follow the steps below and use aseptic technique to administer HIZENTRA.

<table>
<thead>
<tr>
<th>Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assemble supplies – Gather the HIZENTRA vial(s), disposable supplies (not provided with HIZENTRA), and other items (infusion pump, sharps or other container, patient’s treatment diary/log book) needed for the infusion.</td>
</tr>
<tr>
<td>2. Clean surface – Thoroughly clean a flat surface using an alcohol wipe.</td>
</tr>
<tr>
<td>3. Wash hands – Thoroughly wash and dry hands. The use of gloves when preparing and administering HIZENTRA is optional.</td>
</tr>
<tr>
<td>4. Check vials – Carefully inspect each vial of HIZENTRA. Do not use the vial if the liquid looks cloudy, contains particles, has changed color, the protective cap is missing, or the expiration date on the label has passed.</td>
</tr>
</tbody>
</table>

For self-administration, provide the patient with instructions and training for subcutaneous infusion in the home or other appropriate setting.

3 DOSAGE FORMS AND STRENGTHS

HIZENTRA is a 0.2 g/mL (20%) protein solution for subcutaneous infusion.
4 CONTRAINDICATIONS
HIZENTRA is contraindicated in patients with:
- History of anaphylactic or severe systemic reaction to human immune globulin or inactive ingredients of HIZENTRA, such as polysorbate 80.
- Hyperprolactinemia Type I or II because it contains L-proline as a stabilizer. See Description (11).
- lgA-deficiency with antibodies against lgA and a history of hypersensitivity. See Description (11).

5 WARNINGS AND PRECAUTIONS

5.1 Hypersensitivity
Severe hypersensitivity reactions may occur to human immune globulin or components of HIZENTRA, such as polysorbate 80. If a hypersensitivity reaction occurs, discontinue the HIZENTRA infusion immediately and institute appropriate treatment.

5.2 Thrombosis
Thrombosis may occur following treatment with immune globulin products, including HIZENTRA. Risk factors may include: advanced age, prolonged immobilization, hypercoagulable conditions, history of venous or arterial thrombosis, use of estrogens, indwelling central vascular catheters, hyperlipidemia, and cardiovascular risk factors. Thrombosis may occur in the absence of known risk factors.

5.3 Aseptic Meningitis Syndrome (AMS)
AMS has been reported with use of IGIV or IgSC, including HIZENTRA. The syndrome usually begins within several hours to 2 days following immune globulin treatment. AMS is characterized by the following signs and symptoms: severe headache, nuchal rigidity, drowsiness, fever, photophobia, painful eye movements, nausea, and vomiting. Cerebrospinal fluid (CSF) studies frequently show pleocytosis up to several thousand cells per cubic millimeter, predominantly from the granulocytic series, and elevated protein levels up to several hundred mg/dL. AMS may occur more frequently in association with high doses (≥2 g/kg) and/or rapid infusion of immune globulin product.

5.4 Renal Dysfunction/Failure
Acute renal dysfunction/failure, acute tubular necrosis, proximal tubular nephropathy, osmotic nephrosis and death may occur with use of human immune globulin products, especially those containing sucrose. HIZENTRA does not contain sucrose.

5.5 Hemolysis
HIZENTRA can contain blood group antibodies that may act as hemolysins and induce in vivo coating of red blood cells (RBCs) with immunoglobulin, causing a positive direct antiglobulin (Coombs') test result and hemolysis. Delayed hemolytic anemia can develop subsequent to immune globulin therapy due to enhanced RBC sequestration, and acute hemolysis, consistent with intravascular hemolysis, has been reported.

5.6 Transfusion-Related Acute Lung Injury (TRALI)
Noncardiogenic pulmonary edema may occur in patients administered human immune globulin products. TRALI is characterized by severe respiratory distress, pulmonary edema, hypoxemia, normal left ventricular function, and fever. Typically, it occurs within 1 to 6 hours following transfusion. Patients with TRALI may be managed using oxygen therapy with adequate ventilatory support. Monitor HIZENTRA recipients for pulmonary adverse reactions. If TRALI is suspected, perform appropriate tests for the presence of anti-neutrophil antibodies in both the product and patient's serum.

5.7 Transmissible Infectious Agents
Because HIZENTRA is made from human blood, it may carry a risk of transmitting infectious agents, e.g., viruses, the variant Creutzfeldt-Jakob disease (vCJD) agent and, theoretically, the Creutzfeldt-Jakob disease (CJD) agent. This also applies to unknown or emerging viruses and other pathogens. No cases of transmission of viral diseases or CJD have been associated with the use of HIZENTRA. All infections suspected by a physician to have possibly been transmitted by HIZENTRA should be reported to CSL Behring Pharmacovigilance at 1-866-915-6958.

5.8 Laboratory Tests
Various passively transferred antibodies in immunoglobulin preparations may lead to misinterpretation of the results of serological testing.

6 ADVERSE REACTIONS
The most common adverse reactions (ARs) observed in ≥5% of study subjects receiving HIZENTRA were local reactions (e.g., swelling, redness, heat, pain, hematoma and itching at the infusion site), headache, diarrhea, fatigue, back pain, nausea, pain in extremity, cough, upper respiratory tract infection, rash, pruritus, vomiting, abdominal pain (upper), migraine, arthralgia, pain, fall and nasopharyngitis.

6.1 Clinical Trials Experience
Because clinical studies are conducted under widely varying conditions, AR rates observed in clinical studies of a product cannot be directly compared to rates in the clinical studies of another product and may not reflect the rates observed in clinical practice.

Treatment of Primary Immunodeficiency (PI)

PI U.S. Study
The safety of HIZENTRA was evaluated in a clinical study in the U.S. for 15 months (3-month wash-in/wash-out period followed by a 12-month efficacy period) in subjects with PI who had been treated previously with IGIV every 3 or 4 weeks. The safety analyses included 49 subjects in the intention-to-treat (ITT) population. The ITT population consisted of all subjects who received at least one dose of HIZENTRA [see Clinical Studies (14)]. Subjects were treated with HIZENTRA at weekly median doses ranging from 66 to 331 mg/kg body weight (mean: 181.4 mg/kg) during the wash-in/wash-out period and from 72 to 379 mg/kg (mean: 213.2 mg/kg) during the efficacy period. The 49 subjects received a total of 2264 weekly infusions of HIZENTRA.

Table 2 summarizes the most frequent adverse reactions (ARs) (experienced by at least 2 subjects) occurring during or within 72 hours after the end of an infusion. Local reactions were assessed by the investigators 15 to 45 hours post-infusion. The investigators then evaluated the ARs arising from the subject assessments. Local reactions were the most frequent ARs observed, with infusion-site reactions (e.g., swelling, redness, heat, pain, and itching at the site of infusion) comprising 98% of local reactions.

Table 2. Incidence of Subjects with Adverse Reactions (ARs)† (Experienced by 2 or More Subjects) and Rate per Infusion (ITT Population), PI U.S. Study

<table>
<thead>
<tr>
<th>ARs* Occurring During or Within 72 Hours of Infusion</th>
<th>Number (% of Subjects)</th>
<th>Rate of ARs‡ of ARs (n=2264 Infusions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local reactions‡</td>
<td>49 (100)</td>
<td>1322 (0.584)</td>
</tr>
<tr>
<td>Other ARs:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headache</td>
<td>12 (24.5)</td>
<td>32 (0.014)</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>5 (10.2)</td>
<td>6 (0.003)</td>
</tr>
<tr>
<td>Fatigue</td>
<td>4 (8.2)</td>
<td>4 (0.002)</td>
</tr>
<tr>
<td>Back pain</td>
<td>4 (8.2)</td>
<td>5 (0.002)</td>
</tr>
<tr>
<td>Nausea</td>
<td>4 (8.2)</td>
<td>4 (0.002)</td>
</tr>
<tr>
<td>Pain in extremity</td>
<td>4 (8.2)</td>
<td>6 (0.003)</td>
</tr>
<tr>
<td>Cough</td>
<td>4 (8.2)</td>
<td>4 (0.002)</td>
</tr>
<tr>
<td>Vomiting</td>
<td>3 (6.1)</td>
<td>3 (0.001)</td>
</tr>
<tr>
<td>Abdominal pain, upper</td>
<td>3 (6.1)</td>
<td>3 (0.001)</td>
</tr>
<tr>
<td>Migraine</td>
<td>3 (6.1)</td>
<td>4 (0.002)</td>
</tr>
<tr>
<td>Pain</td>
<td>3 (6.1)</td>
<td>4 (0.002)</td>
</tr>
<tr>
<td>Arthralgia</td>
<td>2 (4.1)</td>
<td>3 (0.001)</td>
</tr>
<tr>
<td>Contusion</td>
<td>2 (4.1)</td>
<td>3 (0.001)</td>
</tr>
<tr>
<td>Rash</td>
<td>2 (4.1)</td>
<td>3 (0.001)</td>
</tr>
<tr>
<td>Urticaria</td>
<td>2 (4.1)</td>
<td>2 (&lt;0.001)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AR (≥2 Subjects)</th>
<th>Number (% of Subjects)</th>
<th>Rate of ARs‡ of ARs (n=2264 Infusions)</th>
</tr>
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<tbody>
<tr>
<td>Local reactions‡</td>
<td>49 (100)</td>
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<td>Diarrhea</td>
<td>5 (10.2)</td>
<td>6 (0.003)</td>
</tr>
<tr>
<td>Fatigue</td>
<td>4 (8.2)</td>
<td>4 (0.002)</td>
</tr>
<tr>
<td>Back pain</td>
<td>4 (8.2)</td>
<td>5 (0.002)</td>
</tr>
<tr>
<td>Nausea</td>
<td>4 (8.2)</td>
<td>4 (0.002)</td>
</tr>
<tr>
<td>Pain in extremity</td>
<td>4 (8.2)</td>
<td>6 (0.003)</td>
</tr>
<tr>
<td>Cough</td>
<td>4 (8.2)</td>
<td>4 (0.002)</td>
</tr>
<tr>
<td>Vomiting</td>
<td>3 (6.1)</td>
<td>3 (0.001)</td>
</tr>
<tr>
<td>Abdominal pain, upper</td>
<td>3 (6.1)</td>
<td>3 (0.001)</td>
</tr>
<tr>
<td>Migraine</td>
<td>3 (6.1)</td>
<td>4 (0.002)</td>
</tr>
<tr>
<td>Pain</td>
<td>3 (6.1)</td>
<td>4 (0.002)</td>
</tr>
<tr>
<td>Arthralgia</td>
<td>2 (4.1)</td>
<td>3 (0.001)</td>
</tr>
<tr>
<td>Contusion</td>
<td>2 (4.1)</td>
<td>3 (0.001)</td>
</tr>
<tr>
<td>Rash</td>
<td>2 (4.1)</td>
<td>3 (0.001)</td>
</tr>
<tr>
<td>Urticaria</td>
<td>2 (4.1)</td>
<td>2 (&lt;0.001)</td>
</tr>
</tbody>
</table>

1 Excluding infections.
2 Rate of ARs per infusion.
3 Includes infusion-site reactions as well as bruising, scabbing, pain, irritation, cuts, eczema, and nodules at the infusion site.
4 The ratio of infusions with ARs, including local reactions, to all infusions was 1303 to 2264 (57.6%). Excluding local reactions, the corresponding ratio was 56 to 2264 (2.5%).
kg body weight dose than among subjects who received the 0.2 g/kg body weight dose (29.3% and 19.3%, respectively). The exposure-adjusted rate of local reactions per subject remained greater in the 0.4 g/kg body weight dose group compared to the 0.2 g/kg body weight dose group after adjusting for the greater mean duration of exposure to HIZENTRA in the 0.4 g/kg body weight dose group (129 days) compared to that of the 0.2 g/kg body weight dose group (119 days). All local reactions were either mild (does not interfere with routine activities [93.4%]) or moderate (interferes somewhat with routine activities and may have warranted intervention [6.3%]) in intensity.

No deaths or serious ARs occurred during the study. Two subjects withdrew from the study due to ARs. One subject experienced a severe infusion-site reaction one day after the third weekly infusion, and the other subject experienced moderate myositis.

### PI European Study

In a clinical study conducted in Europe, the safety of HIZENTRA was evaluated for 10 months (3-month wash-in/wash-out period followed by a 7-month efficacy period) in 51 subjects with PI who had been treated previously with IGIV every 3 or 4 weeks or with IGIV weekly.

Subjects were treated with HIZENTRA at weekly median doses ranging from 59 to 267 mg/kg body weight (mean: 118.8 mg/kg) during the wash-in/wash-out period and from 59 to 243 mg/kg (mean: 120.1 mg/kg) during the efficacy period. The 51 subjects received a total of 1831 weekly infusions of HIZENTRA.

Table 4 summarizes the most frequent ARs (experienced by at least 2 subjects) occurring during or within 72 hours after the end of an infusion. Local reactions were assessed by the investigators and evaluated based on the ARs arising from the subject assessments.

### Table 5. CIDP SC Treatment Period – ARs Occurring in ≥5% of Subjects Treated with HIZENTRA and at a Higher Frequency than Placebo-Treated Subjects

<table>
<thead>
<tr>
<th>Placebo</th>
<th>0.2 g/kg HIZENTRA</th>
<th>0.4 g/kg HIZENTRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Reactions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headache</td>
<td>2 (3.5)</td>
<td>2 (0.001)</td>
</tr>
<tr>
<td>Dizziness</td>
<td>1 (1.8)</td>
<td>1 (&lt;0.001)</td>
</tr>
<tr>
<td>Fatigue</td>
<td>1 (1.8)</td>
<td>1 (&lt;0.001)</td>
</tr>
<tr>
<td>Upper respiratory tract infection</td>
<td>2 (3.5)</td>
<td>2 (0.001)</td>
</tr>
<tr>
<td>Fall</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Back pain</td>
<td>1 (1.8)</td>
<td>1 (&lt;0.001)</td>
</tr>
<tr>
<td>Arthralgia</td>
<td>1 (1.8)</td>
<td>1 (&lt;0.001)</td>
</tr>
<tr>
<td>Pain in Extremity</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Table 4. Incidence of Subjects with Adverse Reactions (ARs)* (Experienced by 2 or More Subjects) and Rate per Infusion, PI European Study

<table>
<thead>
<tr>
<th>AR ‡ Occurring During or Within 72 Hours of Infusion</th>
<th>AR (≥2 Subjects)</th>
<th>Number (%) of Subjects (n=51)</th>
<th>Rate (Rate/Infusion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local reactions †‡</td>
<td>24 (47.1)</td>
<td>105 (0.057)</td>
<td></td>
</tr>
<tr>
<td>Other ARs:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headache</td>
<td>9 (17.6)</td>
<td>20 (0.011)</td>
<td></td>
</tr>
<tr>
<td>Rash</td>
<td>4 (7.8)</td>
<td>4 (0.002)</td>
<td></td>
</tr>
<tr>
<td>Pruritus</td>
<td>4 (7.8)</td>
<td>13 (0.007)</td>
<td></td>
</tr>
<tr>
<td>Fatigue</td>
<td>3 (5.9)</td>
<td>5 (0.003)</td>
<td></td>
</tr>
<tr>
<td>Abdominal pain, upper</td>
<td>2 (3.9)</td>
<td>3 (0.002)</td>
<td></td>
</tr>
<tr>
<td>Arthralgia</td>
<td>2 (3.9)</td>
<td>2 (0.001)</td>
<td></td>
</tr>
<tr>
<td>Erythema</td>
<td>2 (3.9)</td>
<td>4 (0.002)</td>
<td></td>
</tr>
<tr>
<td>Abdominal discomfort</td>
<td>2 (3.9)</td>
<td>3 (0.002)</td>
<td></td>
</tr>
<tr>
<td>Back pain</td>
<td>2 (3.9)</td>
<td>2 (0.001)</td>
<td></td>
</tr>
<tr>
<td>Hematoma</td>
<td>2 (3.9)</td>
<td>3 (0.002)</td>
<td></td>
</tr>
<tr>
<td>Hypersensitivity</td>
<td>2 (3.9)</td>
<td>4 (0.002)</td>
<td></td>
</tr>
</tbody>
</table>

* Excluding infections.
† Rate of ARs per infusion.
‡ Includes infusion-related reaction, infusion-site mass; infusion-injection-site erythema, hematoma, induration, inflammation, edema, pain, pruritus, rash, reaction, swelling, infusion-site extravasation, nodular; puncture-site reaction.

The proportion of subjects reporting local reactions decreased over time from approximately 20% following the first infusion to <5% by the end of the study.

Three subjects withdrew from the study due to ARs of mild to moderate intensity. One subject experienced infusion-site pain and infusion-site pruritus; the second subject experienced infusion-site reaction, fatigue, and feeling cold; and the third subject experienced infusion-site reaction and hypersensitivity.

Biweekly (Every 2 Weeks) or Frequent (2 To 7 Times Per Week) Dosing

No data regarding ARs are available for these alternative HIZENTRA dosing regimens because no clinical trials using these regimens were conducted.

### Treatment of Chronic Inflammatory Demyelinating Polyneuropathy (CIDP)

The safety of 2 doses of HIZENTRA (0.2 g/kg body weight or 0.4 g/kg body weight) versus placebo was evaluated in the 24-week subcutaneous (SC) treatment period of a clinical study in subjects with CIDP who had been treated previously with IGIV [see Clinical Studies (14.2)]. The dose was administered once a week in 2 infusion sessions conducted on 1 or 2 consecutive day(s). The safety population included 172 subjects.

Table 5 summarizes the most frequent ARs that occurred in ≥5% of subjects treated with HIZENTRA and at a higher frequency than placebo. The overall AR rates were similar in the 0.2 g/kg body weight and 0.4 g/kg body weight HIZENTRA dose groups (50.9% and 46.6%, respectively) and higher than placebo (33.3%). The most frequent ARs were local infusion site reactions. Local reactions were more frequent among subjects who received the 0.4 g/kg body weight dose than among subjects who received the 0.2 g/kg body weight dose (29.3% and 19.3%, respectively). The exposure-adjusted rate of local reactions per subject remained greater in the 0.4 g/kg body weight dose group compared to the 0.2 g/kg body weight dose group after adjusting for the greater mean duration of exposure to HIZENTRA in the 0.4 g/kg body weight dose group (129 days) compared to that of the 0.2 g/kg body weight dose group (119 days). All local reactions were either mild (does not interfere with routine activities [94.5%]) or moderate (interferes somewhat with routine activities and may have warranted intervention [5.5%]) in intensity and the frequency tended to decrease over time. No subject withdrew because of local reaction.

One serious AR, allergic dermatitis was reported in the 0.2 g/kg body weight HIZENTRA group which started at SC Week 9 and lasted 15 days. One subject withdrew from the study due to a non-serious AR, fatigue.

### Table 6. CIDP SC Treatment Period – ARs Occurring in ≥5% of Subjects Treated with HIZENTRA and at a Higher Frequency than Placebo-Treated Subjects

<table>
<thead>
<tr>
<th>AR (≥2 Subjects)</th>
<th>Number (%) of Subjects (n=57)</th>
<th>Rate (Rate/Infusion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local reactions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headache</td>
<td>7 (12.3)</td>
<td>7 (0.050)</td>
</tr>
<tr>
<td>Dizziness</td>
<td>4 (7.0)</td>
<td>5 (0.002)</td>
</tr>
<tr>
<td>Fatigue</td>
<td>4 (7.0)</td>
<td>4 (0.002)</td>
</tr>
<tr>
<td>Upper respiratory tract infection</td>
<td>4 (7.0)</td>
<td>6 (0.003)</td>
</tr>
<tr>
<td>Fall</td>
<td>3 (5.3)</td>
<td>8 (0.004)</td>
</tr>
<tr>
<td>Back pain</td>
<td>3 (5.3)</td>
<td>4 (0.002)</td>
</tr>
<tr>
<td>Arthralgia</td>
<td>2 (3.5)</td>
<td>2 (0.001)</td>
</tr>
<tr>
<td>Pain in Extremity</td>
<td>2 (3.5)</td>
<td>3 (0.001)</td>
</tr>
</tbody>
</table>
The following adverse reactions have been reported during postmarketing use of immune globulin products:\textsuperscript{5}

- **Infusion reactions:** Wheezing, rigors, myalgia
- **Renal:** Osmotic nephropathy
- **Respiratory:** Apnea, Acute Respiratory Distress Syndrome (ARDS), cyanosis, hypoxemia, pulmonary edema, bronchospasm
- **Cardiovascular:** Cardiac arrest, vascular collapse, hypotension
- **Neurological:** Coma, loss of consciousness, seizures, aseptic meningitis syndrome
- **Integumentary:** Stevens-Johnson syndrome, epidermolysis, erythema multiforme, dermatitis (e.g., bullous dermatitis)
- **Hematologic:** Pancrenopenia, leukopenia, hemolysis, positive direct antiglobulin (Coombs’ test)
- **Gastrointestinal:** Hepatic dysfunction

To report SUSPECTED ADVERSE REACTIONS, contact CSL Behring Pharmacovigilance at 1-866-915-6958 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

7 DRUG INTERACTIONS

7.1 Live Virus Vaccines

The passive transfer of antibodies with immunoglobulin administration may interfere with the response to live virus vaccines such as measles, mumps, rubella, and varicella (see Patient Counseling Information (17)).

7.2 Serological Testing

Various passively transferred antibodies in immunoglobulin preparations may lead to misinterpretation of the results of serological testing.

8 USE IN SPECIFIC POPULATIONS

8.1 Pregnancy

**Risk Summary**

No human data are available to indicate the presence or absence of drug-associated risk. Animal reproduction studies have not been conducted with HIZENTRA. It is not known whether HIZENTRA can cause fetal harm when administered to a pregnant woman or can affect reproduction capacity. Immune globulins cross the placenta from maternal circulation increasingly after 30 weeks of gestation. HIZENTRA should be given to pregnant women only if clearly needed. In the U.S. general population, the estimated background risk of major birth defects and miscarriage in clinically recognized pregnancies is 2-4% and 15-20%, respectively.

8.2 Lactation

**Risk Summary**

No human data are available to indicate the presence or absence of drug-associated risk. The developmental and health benefits of breastfeeding should be considered along with the mother’s clinical need for HIZENTRA and any potential adverse effects on the breastfed infant from HIZENTRA or from the underlying maternal condition.

8.4 Pediatric Use

**Treatment of Primary Immunodeficiency**

*Clinical Studies (Weekly Dosing)*

The safety and effectiveness of weekly HIZENTRA have been established in the pediatric age groups 2 to 16. HIZENTRA was evaluated in 10 pediatric subjects with PI (3 children and 7 adolescents) in a study conducted in the U.S. (see Clinical Studies (14)) and in 23 pediatric subjects with PI (18 children and 5 adolescents) in Europe. There were no differences in the pharmacokinetics, safety and efficacy profiles as compared with adult subjects. No pediatric-specific dose requirements were necessary to achieve the desired serum IgG levels.

**Pharmacokinetic Modeling and Simulation (Biweekly or more Frequent Dosing)**

The biweekly (every 2 weeks) or more frequent dosing (2 to 7 times per week) regimens, developed from population PK-based modeling and simulation, included 57 pediatric subjects (92 from HIZENTRA clinical studies) (see Clinical Pharmacology (12.3)). HIZENTRA dosing is adjusted to body weight. No pediatric-specific dose requirements are necessary for these regimens.

**Safety and effectiveness of HIZENTRA in pediatric patients below the age of 2 have not been established.**

**Treatment of Chronic Inflammatory Demyelinating Polyneuropathy**

The safety and effectiveness of HIZENTRA have not been established in patients with CIDP who are under the age of 18.

8.5 Geriatric Use

**Treatment of Primary Immunodeficiency**

Of the 49 subjects evaluated in the U.S. clinical study of HIZENTRA, 6 subjects were 65 years of age or older. No overall differences in safety or efficacy were observed between these subjects and subjects 18 to 65 years of age. The clinical study of HIZENTRA in Europe did not include subjects over the age of 65.

**Treatment of Chronic Inflammatory Demyelinating Polyneuropathy**

Of the 172 subjects evaluated in the SC treatment period of a global study (HIZENTRA vs placebo), 50 subjects were >65 years of age (34 HIZENTRA and 16 placebo subjects). No overall differences in safety or efficacy were observed between these subjects and subjects 18 to 65 years of age.

11 DESCRIPTION

HIZENTRA, Immune Globulin Subcutaneous (Human), 20% Liquid, is a ready-to-use, sterile 20% (0.2 g/mL) protein liquid preparation of polyvalent human immunoglobulin G (IgG) for subcutaneous administration. HIZENTRA is manufactured from large pools of human plasma by a combination of cold alcohol fractionation, octanocid acid fractionation, and anion exchange chromatography. The IgG proteins are not subjected to heating or to chemical or enzymatic modification. The Fc and Fab functions of the IgG molecule are retained. Fab functions tested include antigen binding capacities, and Fc functions tested include complement activation and Fc-receptor-mediated leukocyte activation (determined with complexed IgG).

HIZENTRA has a purity of ≥98% IgG and a pH of 4.6 to 5.2. This product contains approximately 250 mg/mL (range: 210 to 290 mg/mL) L-proline (a nonessential amino acid) as a stabilizer, 8 to 30 mg/L polysorbate B0, and trace amounts of sodium. HIZENTRA contains ≤50 mcg/mL IgA, no carbohydrate stabilizers (e.g., sucrose, maltose) and no preservative.

Plasma units used in the manufacture of HIZENTRA are tested using FDA-licensed serological assays for hepatitis B surface antigen and antibodies to human immunodeficiency virus (HIV)-1 and 2, hepatitis C virus (HCV) as well as FDA-licensed Nucleic Acid Testing (NAT) for HBV, HCV and HIV-1. All plasma units have been found to be nonreactive (negative) in these tests. In addition, the plasma has been tested for B19 virus (B19V) DNA by NAT. Only plasma that passes virus screening is used for production, and the limit for B19V in the fractionation pool is set to not exceed 10^4 IU of B19V DNA per mL.

The manufacturing process for HIZENTRA includes three steps to reduce the risk of virus transmission. Two of these are dedicated virus clearance steps: pH 4 incubation to inactivate enveloped viruses, and virus filtration to remove, by size exclusion, both enveloped and non-enveloped viruses as small as approximately 20 nanometers. In addition, a depth filtration step contributes to the virus reduction capacity.

These steps have been independently validated in a series of in vitro experiments for their capacity to inactivate and/or remove both enveloped and non-enveloped viruses. Table 6 shows the virus clearance during the manufacturing process for HIZENTRA, expressed as the mean log_{10} reduction factor (LRF).

**Table 6. Virus Inactivation/Removal in HIZENTRA**

<table>
<thead>
<tr>
<th>Virus Property</th>
<th>HIV-1</th>
<th>PRV</th>
<th>BVDV</th>
<th>WNV</th>
<th>EMCV</th>
<th>MVM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Envelope</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Size (nm)</td>
<td>80-100</td>
<td>120-200</td>
<td>50-70</td>
<td>50-70</td>
<td>25-30</td>
<td>18-24</td>
</tr>
<tr>
<td>Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step</td>
<td>Mean LRF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH 4 incubation</td>
<td>≥5.4</td>
<td>≥5.9</td>
<td>4.6</td>
<td>≥7.8</td>
<td>nt</td>
<td>nt</td>
</tr>
<tr>
<td>Depth filtration</td>
<td>≥5.3</td>
<td>≥5.6</td>
<td>2.1</td>
<td>3.0</td>
<td>4.2</td>
<td>2.3</td>
</tr>
<tr>
<td>Virus filtration</td>
<td>≥5.5</td>
<td>≥5.5</td>
<td>≥1.5</td>
<td>≥5.9</td>
<td>≥5.4</td>
<td>≥5.5</td>
</tr>
<tr>
<td>Overall Reduction (Log_{10} Units)</td>
<td>≥16.0</td>
<td>≥17.7</td>
<td>≥11.8</td>
<td>≥16.7</td>
<td>≥9.6</td>
<td>≥7.8</td>
</tr>
</tbody>
</table>

HIV-1: human immunodeficiency virus type 1; PRV: pseudorabies virus, a nonspecific model for large enveloped DNA viruses (e.g., herpes virus); BVDV: bovine viral diarrhea virus, a model for hepatitis C virus; WNV: West Nile virus; EMCV: encephalomyocarditis virus, a model for a hepatitis A virus; MVM: minute virus of mice, a model for a small, highly resistant non-enveloped DNA virus (e.g., porcine virus); LRF: log_{10} reduction factor; nt: not tested; na: not applicable.

The virus clearance of human parvovirus B19 was investigated experimentally at the pH 4 incubation step. The estimated LRF obtained was ≥5.3.

The manufacturing process was also investigated for its capacity to decrease the infectivity of an experimental agent of transmissible spongiform encephalopathy (TSE), considered a model for CJD and its variant (vCJD).\textsuperscript{11} Several of the production steps have been shown to decrease infectivity of an experimental TSE model agent. TSE reduction steps include octanocid acid fractionation (≥6.4 log_{10}), depth filtration (2.6 log_{10}), and virus filtration (≥5.8 log_{10}). These studies provide reasonable assurance that low levels of vCJD/CJD agent infectivity, if present in the starting material, would be removed.

12 CLINICAL PHARMACOLOGY

12.1 Mechanism of Action

HIZENTRA supplies a broad spectrum of opsonizing and neutralizing IgG antibodies against a wide variety of bacterial and viral agents. The mechanism of action has not been fully elucidated, but may include immunomodulatory effects.

12.3 Pharmacokinetics

**Treatment of Primary Immunodeficiency**

*Clinical Studies*

The pharmacokinetics (PK) of HIZENTRA was evaluated in a PK study of subjects (14 adults, 1 pediatric subject aged 6 to <12 years, and 3 adolescent subjects aged 12 to <16 years) with PI participating in the 15-month efficacy and safety study (see Clinical Studies (14)). All PK subjects were treated previously with PRIVIGEN®, Immune Globulin Intravenous (Human), 10% Liquid and were switched to weekly subcutaneous treatment with HIZENTRA. After a 3-month wash-in/wash-out period, doses were adjusted individually with the goal of providing a systemic serum IgG exposure (area under the IgG serum concentration vs time curve; AUC) not inferior to that of the previous weekly-equivalent IGIV dose. Table 7 summarizes PK parameters for subjects in the substudy following treatment with HIZENTRA and IGIV.
For the 19 subjects completing the wash-in/wash-out period, the average dose adjustment for HIZENTRA was 153% (range: 126% to 187%) of the previous weekly-equivalent IGIV dose. After 12 weeks of treatment with HIZENTRA at this individually adjusted dose, the final steady-state AUC determinations were made in 18 of the 19 subjects. The geometric mean ratio of the steady-state AUCs, standardized to a weekly treatment period, for HIZENTRA vs IGIV treatment was 1.002 (range: 0.77 to 1.20) with a 90% confidence limit of 0.951 to 1.055 for the 18 subjects.

With HIZENTRA, peak serum levels are lower (1616 vs 2564 mg/dL) and trough levels are generally higher (1448 vs 1127 mg/dL). PK modeling and simulation also predicted changes in trough levels after switching from (a) monthly IGIV to weekly or biweekly HIZENTRA dosing, (b) weekly to biweekly HIZENTRA dosing, or (c) weekly to more frequent dosing. Table 9 (last column) shows the predicted changes in steady-state IgG trough levels after switching between the various dosing regimens.

### Table 9. Predicted Ratios* {Median (5th, 95th percentiles)} of AUC, C_{max} and C_{min} and Changes in IgG Trough Levels after Switching Between IgG Dosing Regimens for Primary Humoral Immune Deficiency

<table>
<thead>
<tr>
<th>From: To:</th>
<th>AUC</th>
<th>C_{max}</th>
<th>C_{min}</th>
<th>Predicted Change in Trough†</th>
</tr>
</thead>
<tbody>
<tr>
<td>IGIV</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.04 increase</td>
</tr>
<tr>
<td>Weekly</td>
<td>1.01</td>
<td>1.01</td>
<td>1.01</td>
<td>1.04 increase</td>
</tr>
<tr>
<td>HIZENTRA</td>
<td>0.99</td>
<td>0.99</td>
<td>0.99</td>
<td>1.04 increase</td>
</tr>
<tr>
<td>Biweekly</td>
<td>1.01</td>
<td>1.01</td>
<td>1.01</td>
<td>1.04 increase</td>
</tr>
<tr>
<td>HIZENTRA</td>
<td>0.99</td>
<td>0.99</td>
<td>0.99</td>
<td>1.04 increase</td>
</tr>
<tr>
<td>Weekly</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.04 increase</td>
</tr>
<tr>
<td>HIZENTRA</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
<td>1.04 increase</td>
</tr>
<tr>
<td>Biweekly</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.04 increase</td>
</tr>
<tr>
<td>HIZENTRA</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
<td>1.04 increase</td>
</tr>
</tbody>
</table>

* Ratios are based on comparison of second regimen vs first regimen.
† Approximate change in trough based on predicted median C_{min} ratio.
‡ Weekly dose based on dose adjustment factor of 1.37 when switching from IGIV.
§ Biweekly dose = 2x weekly dose, based on dose adjustment factor of 1.37 when switching from IGIV.

For IGIV: weekly-equivalent dose.

Clinical Pharmacology (12.3)

PK-based modeling and simulation results indicate that, similar to observations from the clinical study with weekly HIZENTRA dosing (Table 8), body weight-adjusted biweekly dosing accounted for age-related (>3 years) differences in clearance of HIZENTRA, thereby maintaining systemic IgG exposure (AUC values) in the therapeutic range.

Treatment of Chronic Inflammatory Demyelinating Polyneuropathy

In the PATH study, subjects (n=172) achieved sustained trough levels over a period of 24 weeks when receiving weekly doses of 0.2 g/kg body weight and 0.4 g/kg body weight, respectively. The mean (SD) IgG trough concentration after 24 weeks of HIZENTRA treatment in the 0.2 g/kg body weight group was 15.3 (2.57) g/L and in the 0.4 g/kg body weight group was 20.8 (3.23) g/L.

13 NONCLINICAL TOXICOLOGY

13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

No animal studies were conducted to evaluate the carcinogenic or mutagenic effects of HIZENTRA or its effects on fertility.

13.2 Animal Toxicology and/or Pharmacology

Long- and short-term memory loss was seen in juvenile rats in a study modeling hyperprolinemia. In this study, rats received daily subcutaneous injections with L-proline from day 6 to day 28 of life. The daily amounts of L-proline used in this study were more than 60 times higher than the L-proline dose that would result from the administration of 400 mg/kg body weight of HIZENTRA once weekly. In unpublished studies using the same animal model (i.e., rats) dosed with the same amount of L-proline with a dosing interval relevant to IGSC treatment (i.e., on 5 consecutive days on days 9 to 13, or once weekly on days 9, 16, and 23), no effects on learning and memory were observed. The clinical relevance of these studies is not known.

14 CLINICAL STUDIES

14.1 Primary Immunodeficiency (PI)

A prospective, open-label, multicenter, single-arm, clinical study conducted in the U.S. evaluated the efficacy, tolerability, and safety of HIZENTRA in 49 adult and pediatric subjects with PI. Subjects previously receiving monthly treatment with IGIV were switched to weekly subcutaneous administration of HIZENTRA for 15 months. Following a 3-month wash-in/wash-out period, subjects received a dose adjustment to achieve an equivalent AUC to their previous IGIV dose (see Clinical Pharmacology (12.3)) and continued resulting in more sustained IgG exposures. See Table 9 (columns for AUC, C_{max} and C_{min}).

### Dose Adjustment Factor

Using data from four clinical studies, results of model-based simulations demonstrated that weekly or biweekly HIZENTRA dosing regimens with an IGIV/IGSC dose adjustment factor of 1:1.37 adequately maintain median AUC_{28dys} and C_{min} ratios at ±90% of values observed with 4-weekly IGIV dosing. See Table 9 (top two rows).

### Table 7. Pharmacokinetics Parameters of HIZENTRA and IGIV, PI U.S. Study

<table>
<thead>
<tr>
<th>Number of subjects</th>
<th>HIZENTRA</th>
<th>IGIV* (PRIVILEG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dose* (mg/kg)</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly</td>
<td>228</td>
<td>141-381</td>
</tr>
<tr>
<td>1.37</td>
<td>86-254</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IgG peak levels (mg/dL)</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly</td>
<td>1616</td>
<td>1090-2825</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IgG trough levels (mg/dL)</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly</td>
<td>1448</td>
<td>952-2623</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AUC (day x mg/dL)</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly</td>
<td>10560</td>
<td>7210-18670</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CL (ml/day/kg)</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly</td>
<td>2.2</td>
<td>1.2-3.7</td>
</tr>
</tbody>
</table>

* For IGIV: weekly-equivalent dose.
† Standardized to a 7-day period.
§ Biweekly dose = 2x weekly dose, based on dose adjustment factor of 1.37 when switching from IGIV.

### Table 8. Pediatric Pharmacokinetics Parameters of HIZENTRA, PI European Study

<table>
<thead>
<tr>
<th>Dose (mg/kg)</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly</td>
<td>120</td>
<td>71-170</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>IgG trough levels (mg/dL)</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly</td>
<td>731</td>
<td>531-915</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AUC_{max} (day x mg/dL)</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly</td>
<td>5230</td>
<td>3890-6950</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CL (ml/day/kg)</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly</td>
<td>2.19</td>
<td>1.57-3.05</td>
</tr>
</tbody>
</table>

**PK modeling and simulation also predicted changes in trough levels after switching from (a) monthly IGIV to weekly or biweekly HIZENTRA dosing, (b) weekly to biweekly HIZENTRA dosing, or (c) weekly to more frequent dosing.**

### Pharmacokinetic Modeling and Simulation

**Biweekly (Every 2 Weeks) or more Frequent Dosing**

Pharmacokinetic characterization of biweekly or more frequent dosing of HIZENTRA was undertaken using population PK-based modeling and simulation. Serum IgG concentration data consisted of 383 patients from 151 unique pediatric and adult subjects with PI from four clinical studies of IGIV (PRIVILEG) and HIZENTRA. Of the 151 subjects, 94 were adult subjects (63 from HIZENTRA clinical studies) and 57 were pediatric subjects (32 from HIZENTRA clinical studies). Compared with weekly administration, PK modeling and simulation predicted that administration of HIZENTRA on a biweekly basis at double the weekly dose results in comparable IgG exposure (equivalent AUC with a slightly higher IgG peak (C_{max}) and slightly lower trough (C_{min})). In addition, PK modeling and simulation predicted that for the same total weekly dose, HIZENTRA infusions given 2, 3, 5, or 7 times per week (frequent dosing) produce IgG exposures comparable to weekly dosing (equivalent AUCs with a slightly lower IgG peak (C_{max}) and slightly higher trough (C_{min})). Frequent dosing reduces the peak-to-trough variation in HIZENTRA serum levels, thus

<table>
<thead>
<tr>
<th>Study</th>
<th>Number of subjects</th>
<th>Dose (mg/kg)</th>
<th>Range</th>
<th>IgG peak levels (mg/dL)</th>
<th>Mean</th>
<th>Range</th>
<th>IgG trough levels (mg/dL)</th>
<th>Mean</th>
<th>Range</th>
<th>AUC (day x mg/dL)</th>
<th>Mean</th>
<th>Range</th>
<th>CL (ml/day/kg)</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIZENTRA</td>
<td>18</td>
<td>228</td>
<td>141-381</td>
<td>1616</td>
<td>1090-2825</td>
<td>1448</td>
<td>952-2623</td>
<td>10560</td>
<td>7210-18670</td>
<td>2.2</td>
<td>1.2-3.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IGIV*</td>
<td>18</td>
<td>152</td>
<td>86-254</td>
<td>2564</td>
<td>2046-3456</td>
<td>1127</td>
<td>702-1810</td>
<td>10320</td>
<td>8051-15530</td>
<td>1.3</td>
<td>0.9-2.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**AUC, area under the curve; CL, clearance.**

---

**end of transcription**
treatment for a 12-month efficacy period. The efficacy analyses included 38 subjects in the modified intention-to-treat (MITT) population. The MITT population consisted of subjects who completed the wash-in/wash-out period and received at least one infusion of HIZENTRA during the efficacy period.

Although 5% of the administered doses could not be verified, the weekly median doses of HIZENTRA ranged from 72 to 379 mg/kg body weight during the efficacy period. The mean dose was 213.2 mg/kg, which was 149% of the previous IGIV dose.

In the study, the number of infusion sites per infusion ranged from 1 to 12. In 73% of infusions, the number of infusion sites was 4 or fewer. Up to 4 simultaneous infusion sites were permitted using 2 pumps; however, more than 4 sites could be used consecutively during one infusion. The infusion flow rate did not exceed 50 mL per hour for all infusion sites combined. During the efficacy period, the median duration of a weekly infusion ranged from 1.6 to 2.0 hours.

The study evaluated the annual rate of serious bacterial infections (SBIs), defined as bacterial pneumonia, bacteremia/septicemia, osteomyelitis/septic arthritis, bacterial meningitis, and visceral abscess. The study also evaluated the annual rate of any infections, the use of antibiotics for infection (prophylaxis or treatment), the days out of work/school/kindergarten/day care or unable to perform normal activities due to infections, hospitalizations due to infections, and serum IgG trough levels.

Table 10 summarizes the efficacy results for subjects in the efficacy period (MITT population) of the study. No subjects experienced an SBI in this study.

### Table 10. Summary of Efficacy Results (MITT Population)

| Reason | Number of days (%)
|--------|------------------|
| Hospitalizations due to infections | 2.06 days/subject year
| Number of subject days | 12,605
| Days out of work/school/Kindergarten/day care or unable to perform normal activities due to infections | 0.06 (0.06)
| Number of subject days | 12,697
| Annual rate of any infections | 2.76 infections/subject year
| Annual rate of SBIs* | 0 SBIs per subject year
| Number of subjects (%) | 27 (71.1)
| Number of SBI (%) | 71 (0.56)
| Antibiotic use for infection (prophylaxis or treatment) Annual rate | 48.5 days/subject year
| Total number of subject days | 38
| Number of subjects (efficacy period) | 38

* Defined as bacterial pneumonia, bacteremia/septicemia, osteomyelitis/septic arthritis, bacterial meningitis, and visceral abscesses.
† Upper 99% confidence limit: 0.132.
‡ Upper one-sided 99% confidence limit of 0.192
§ Based on 1 subject.

The mean IgG trough levels increased by 24.2%, from 1009 mg/dL during the efficacy period.

The study evaluated the annual rate of serious bacterial infections (SBIs), defined as bacterial pneumonia, bacteremia/septicemia, osteomyelitis/septic arthritis, bacterial meningitis, and visceral abscess.

In a prospective, open-label, multicenter, single-arm, clinical study conducted in Europe, 51 adult and pediatric subjects with PI switched from monthly IGIV (31 subjects) or weekly IGSC (20 subjects) to weekly treatment with HIZENTRA. For the 46 subjects in the efficacy analysis, the weekly mean dose in the efficacy period was 120.1 mg/kg (range 59 to 243 mg/kg), which was 104% of the previous weekly equivalent IGIV or weekly IGSC dose. None of the subjects had an SBI during the efficacy period, resulting in an annualized rate of 0 (upper one-sided 99% confidence limit of 0.192) SBIs per subject. The annualized rate of any infections was 5.18 infections per subject during the efficacy period.

### European Study

In a prospective, open-label, multicenter, single-arm, clinical study conducted in Europe, 51 adult and pediatric subjects with PI switched from monthly IGIV (31 subjects) or weekly IGSC (20 subjects) to weekly treatment with HIZENTRA. For the 46 subjects in the efficacy analysis, the weekly mean dose in the efficacy period was 120.1 mg/kg (range 59 to 243 mg/kg), which was 104% of the previous weekly equivalent IGIV or weekly IGSC dose. None of the subjects had an SBI during the efficacy period, resulting in an annualized rate of 0 (upper one-sided 99% confidence limit of 0.192) SBIs per subject. The annualized rate of any infections was 5.18 infections per subject during the efficacy period.

### 14.2 Chronic Inflammatory Demyelinating Polyneuropathy (CIDP)

A multicenter, double-blind, randomized, placebo-controlled, parallel-group phase 3 study evaluated the efficacy, safety, and tolerability of 2 different weekly doses of HIZENTRA (0.4 g/kg body weight and 0.2 g/kg body weight) versus placebo in 172 adult subjects with CIDP and previously treated with IGIV (PATH study). The mean treatment duration was 129 days in the 0.4 g/kg HIZENTRA group and 118.9 days in the 0.2 g/kg HIZENTRA group (treatment duration up to 166 and 167 days in each group, respectively). Subjects generally used 4 infusion sites in parallel (maximum: 8 sites in parallel). Subjects infused an average of 20 mL per infusion site (maximum: 50 mL/site) with an infusion rate of 20 mL/h (maximum: 50 mL/h) and volumes up to 140 mL per infusion session. The infusion time was approximately 1 hour.

The main endpoint was the percentage of subjects who had a CIDP relapse or were withdrawn for any other reason during the 52 Treatment Period. CIDP relapse was defined as a ≥1 point increase in a modified Inflammatory Neuropathy Cause and Treatment (MNCAT) score compared with baseline. Both HIZENTRA doses demonstrated superiority over placebo for the main endpoint (32.8% for 0.4 g/kg HIZENTRA and 38.6% for 0.2 g/kg HIZENTRA compared with 63.2% for placebo, p<0.001 or p=0.007, respectively), with no statistically significant difference between the doses. When only considering relapse, the CIDP relapse rates were 19.0% for 0.4 g/kg HIZENTRA and 33.3% for 0.2 g/kg HIZENTRA compared with 56.1% for placebo (p<0.001 or p=0.012, respectively), with no statistically significant difference between the doses. Eighty-one percent (81%) and 67% of HIZENTRA-treated subjects remained relapse-free (0.4 g/kg body weight and 0.2 g/kg body weight, respectively); 44% of placebo subjects remained relapse-free for up to 24 weeks.

A Kaplan-Meier Plot of time to CIDP relapse or withdrawal for any other reason is shown in Figure 1.

### Figure 1. Kaplan-Meier Plot Time to CIDP Relapse or Withdrawal for Any Other Reason

Subjects in both HIZENTRA dose groups remained relatively stable while subjects in the placebo group deteriorated in mean INCAT score, mean grip strength, mean Medical Research Council sum score, and mean Rasch-built Overall Disability Scale (R-ODS) centile score.

### 15 REFERENCES


### 16 HOW SUPPLIED/STORAGE AND HANDLING

**How Supplied**

HIZENTRA is supplied in a single-use, tamper-evident vial containing 0.2 grams of protein per mL of preservative-free liquid. The HIZENTRA packaging components are not made with natural rubber latex.
Each product presentation includes a package insert and the following components:

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Carton NDC Number</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 mL</td>
<td>44206-451-01</td>
<td>Vial containing 1 gram of protein (NDC 44206-451-90)</td>
</tr>
<tr>
<td>10 mL</td>
<td>44206-452-02</td>
<td>Vial containing 2 grams of protein (NDC 44206-452-91)</td>
</tr>
<tr>
<td>20 mL</td>
<td>44206-454-04</td>
<td>Vial containing 4 grams of protein (NDC 44206-454-92)</td>
</tr>
<tr>
<td>50 mL</td>
<td>44206-455-10</td>
<td>Vial containing 10 grams of protein (NDC 44206-455-93)</td>
</tr>
</tbody>
</table>

Storage and Handling
- Keep HIZENTRA in its original carton to protect it from light.
- Each vial label contains a peel-off strip with the vial size and product lot number for use in recording doses in a patient treatment record.
- When stored at room temperature (up to 25°C [77°F]), HIZENTRA is stable for up to 30 months, as indicated by the expiration date printed on the outer carton and vial label.
- Do not shake.
- Do not freeze. Do not use product that has been frozen.

17 PATIENT COUNSELING INFORMATION
Advise the patient to read the FDA-approved patient labeling (Patient Information).

Inform patients to immediately report the following signs and symptoms to their healthcare provider:

- 
  - Hypersensitivity reactions to HIZENTRA (including hives, generalized urticaria, tightness of the chest, wheezing, hypotension, and anaphylaxis) [see Warnings and Precautions (5.1)].
  - Pain and/or swelling of an arm or leg with warmth over the affected area, discoloration of an arm or leg, unexplained shortness of breath, chest pain or discomfort that worsens on deep breathing, unexplained rapid pulse, or numbness or weakness on one side of the body [see Warnings and Precautions (5.2)].
  - Severe headache, neck stiffness, drowsiness, fever, sensitivity to light, painful eye movements, nausea, and vomiting [see Warnings and Precautions (5.3)].
  - Decreased urine output, sudden weight gain, fluid retention/edema, and/or shortness of breath [see Warnings and Precautions (5.4)].
  - Fatigue, increased heart rate, yellowing of the skin or eyes, and dark-colored urine [see Warnings and Precautions (5.5)].
  - Severe breathing problems, lightheadedness, drops in blood pressure, and fever [see Warnings and Precautions (5.6)].

Inform patients that because HIZENTRA is made from human blood, it may carry a risk of transmitting infectious agents, e.g., viruses, the variant Creutzfeldt-Jakob disease (vCJD), HIV, and hepatitis B and C [see Warnings and Precautions (5.7)]. Inform patients that HIZENTRA may interfere with the response to live virus vaccines (e.g., measles, mumps, rubella, and varicella) and to notify their immunizing physician of recent therapy with HIZENTRA [see Drug Interactions (7)].

Home Treatment with Subcutaneous Administration
- If self-administration is deemed to be appropriate, ensure that the patient receives clear instructions and training on subcutaneous administration in the home or other appropriate setting and has demonstrated the ability to independently administer subcutaneous infusions.
- Ensure the patient understands the importance of adhering to their prescribed administration schedule to maintain appropriate steady IgG levels.
- Instruct patients to scan the vial if recording the infusion electronically and keep a diary/log book that includes information about each infusion such as, the time, date, dose, lot number(s) and any reactions.
- Inform the patient that mild to moderate local infusion-site reactions (e.g., swelling and redness) are a common side effect of subcutaneous therapy, but to contact their healthcare professional if a local reaction increases in severity or persists for more than a few days.
- Inform patients of the importance of having an infusion needle long enough to reach the subcutaneous tissue and of changing the actual site of infusion with each infusion. Explain that HIZENTRA is for subcutaneous infusion only.
- Inform patients to consider adjusting the infusion-site location, volume per site, and rate of infusion based on how infusions are tolerated.
- Inform patient to interrupt or terminate the HIZENTRA infusion if a hypersensitivity reaction occurs.
- Inform PI patients that they should be tested regularly to make sure they have the correct levels of HIZENTRA (IgG) in their blood. These tests may result in adjustments to the HIZENTRA dose.

Information for Patients
This patient package insert summarizes important information about HIZENTRA. Please read it carefully before using this medicine. This information does not take the place of talking with your healthcare professional, and it does not include all of the important information about HIZENTRA. If you have any questions after reading this, ask your healthcare professional.

What is the important information I should know about HIZENTRA?
HIZENTRA is supposed to be infused under your skin only. DO NOT inject HIZENTRA into a blood vessel (vein or artery).

What is HIZENTRA?
HIZENTRA is a prescription medicine used to treat primary immune deficiency (PI) and chronic inflammatory demyelinating polyneuropathy (CIDP). HIZENTRA is made from human blood. HIZENTRA contains antibodies called immunoglobulin G (IgG). People with PI get a lot of infections, and IgG fights germs (bacteria and viruses). People with CIDP have a form of autoimmune disease where it is believed the body’s defenses attack the nerves and cause muscle weakness and numbness mainly in the legs and arms. IgG is believed to help protect the nerve from being attacked.

Who should NOT take HIZENTRA?
Do not take HIZENTRA if you have too much proline in your blood (called “hyperprolinemia”) or if you have had reactions to polysorbate 80.

How should I take HIZENTRA?
You will take HIZENTRA through an infusion, only under your skin. You will place up to 8 needles into different areas of your body each time you use HIZENTRA. The needles are attached to a pump with an infusion tube. For PI, you can have infusions as often as every day up to every two (2) weeks. For CIDP, infusions are given once weekly (in 1 or 2 sessions conducted on 1 day or 2 consecutive days). For weekly infusions, it can take about 1 to 2 hours to complete an infusion; however, this time may be shorter or longer depending on the dose and frequency your doctor has prescribed for you.

Instructions for using HIZENTRA are at the end of this patient package insert (see “How do I use HIZENTRA?”). Do not use HIZENTRA by yourself until you have been taught how by your doctor or healthcare professional.

What should I avoid while taking HIZENTRA?
Vaccines may not work well for you while you are taking HIZENTRA. Tell your doctor or healthcare professional that you are taking HIZENTRA before you get a vaccine. Tell your doctor or healthcare professional if you are pregnant or planning to become pregnant, or if you are nursing.

What are possible side effects of HIZENTRA?
The most common side effects with HIZENTRA are:
- Redness, swelling, itching, and/or bruising at the infusion site
- Headache/migraine
- Nausea and/or vomiting
- Pain (including pain in the chest, back, joints, arms, legs)
- Fatigue
- Diarrhea
- Stomach ache/bloating
- Cough, cold, or flu symptoms
- Rash (including hives)
- Itching
- Fever and/or chills
- Shortness of breath
- Dizziness
- Fall
- Runny or stuffy nose

Tell your doctor right away or go to the emergency room if you have hives, trouble breathing, wheezing, dizziness, or fainting. These could be signs of a bad allergic reaction. Tell your doctor right away if you have any of the following symptoms. They could be signs of a serious problem.
- Reduced urination, sudden weight gain, or swelling in your legs. These could be signs of a kidney problem.
- Pain and/or swelling of an arm or leg with warmth over the affected area, discoloration of an arm or leg, unexplained shortness of breath, chest pain or discomfort that worsens on deep breathing, unexplained rapid pulse, or numbness or weakness on
one side of the body. These could be signs of a blood clot.

- Bad headache with nausea, vomiting, stiff neck, fever, and sensitivity to light. These could be signs of a brain swelling called meningitis.
- Brown or red urine, fast heart rate, yellow skin or eyes. These could be signs of a blood problem.
- Chest pains or trouble breathing.
- Fever over 100°F. This could be a sign of an infection.

Tell your doctor about any side effects that concern you. You can ask your doctor to give you more information that is available to healthcare professionals.

**How do I use HIZENTRA?**

Infuse HIZENTRA only after you have been trained by your doctor or healthcare professional. Below are step-by-step instructions to help you remember how to use HIZENTRA. Ask your doctor or healthcare professional about any instructions you do not understand.

**Instructions for use**

HIZENTRA comes in single-use vials.

**Step 1: Assemble supplies**

Gather the HIZENTRA vial(s), the following disposable supplies (not provided with HIZENTRA), and other items (infusion pump, sharps or other container, treatment diary or log book):

- Infusion administration tubing
- Needle or catheter sets (for subcutaneous infusion)
- Y-site connectors (if needed)
- Alcohol wipes
- Antiseptic skin preps
- Syringes
- Transfer device or needle(s)
- Gauze and tape, or transparent dressing
- Gloves (if recommended by your doctor)

**Step 2: Clean surface**

Thoroughly clean a table or other flat surface using one of the alcohol wipes.

**Step 3: Wash hands**

- Thoroughly wash and dry your hands (Figure 1).
- If you have been told to wear gloves when preparing your infusion, put the gloves on.

**Step 4: Check vials**

Carefully look at the liquid in each vial of HIZENTRA (Figure 2). HIZENTRA is a pale yellow to light brown solution. Check for particles or color changes. Do not use the vial if:

- The liquid looks cloudy, contains particles, or has changed color.
- The protective cap is missing.
- The expiration date on the label has passed.

**Step 5: Transfer HIZENTRA from vial(s) to syringe**

Take the protective cap off the vial (Figure 3).

Clean the vial stopper with an alcohol wipe (Figure 4). Let the stopper dry.

- Attach a needle or transfer device to a syringe tip, using aseptic technique. If using a transfer device, follow the instructions provided by the device manufacturer. If using a needle and a syringe to transfer HIZENTRA, follow the instructions below.

  - Attach a sterile transfer needle to a sterile syringe (Figure 5).
  - Pull out the plunger of the syringe to fill the syringe with air. Make sure the amount of air is the same as the amount of HIZENTRA you will transfer from the vial.
  - Put the HIZENTRA vial on a flat surface. Keeping the vial upright, insert the transfer needle into the center of the rubber stopper.
  - Check that the tip of the needle is not in the liquid. Then, push the plunger of the syringe down. This will inject the air from the syringe into the airspace of the vial.
  - Leaving the needle in the stopper, carefully turn the vial upside down (Figure 6).
  - Slowly pull back on the plunger of the syringe to fill the syringe with HIZENTRA.
  - Take the filled syringe and needle out of the stopper. Take off the needle and throw it away in the sharps container.

When using multiple vials to achieve the desired dose, repeat this step.

**Step 6: Prepare infusion pump and tubing**

Prepare the infusion pump (following the manufacturer’s instructions) and prime (fill) the infusion tubing. To prime the tubing, connect the syringe filled with HIZENTRA to the infusion tubing and gently push on the syringe plunger to fill the tubing with HIZENTRA (Figure 7).

**Step 7: Prepare infusion site(s)**

- Select an area on your abdomen, thigh, upper arm, or side of upper leg/hip for the infusion (Figure 8).
- Use a different site from the last time you infused HIZENTRA. New sites should be at least 1 inch from a previous site.
- Never infuse into areas where the skin is tender, bruised, red, or hard. Avoid infusing into scars or stretch marks.
- You can use up to 8 infusion sites at the same time. If you are using more than one infusion site, be sure the infusion sites are at least 2 inches apart. More than one infusion device can be used simultaneously.
- Clean the skin at each site with an antiseptic skin prep (Figure 9). Let the skin dry.

**Step 8: Insert needle(s)**

- With two fingers, pinch together the skin around the infusion site. Insert the needle under the skin (Figure 10).
- Put sterile gauze and tape or a transparent dressing over the infusion site (Figure 11). This will keep the needle from coming out.
Step 9: Start infusion
Follow the manufacturer’s instructions to turn on the infusion pump (Figure 12).

Step 10: Record treatment (Figure 13)
Peel off the removable part of the label of the HIZENTRA vial. Put this label in your treatment diary or log book with the date and time of the infusion. Also include the exact amount of HIZENTRA that you infused. Scan the vial if recording the infusion electronically.

Step 11: Clean up
When all the HIZENTRA has been infused, turn off the pump.
- Take off the dressing and take the needle out of the infusion site. Disconnect the tubing from the pump.
- Throw away any HIZENTRA that is leftover in the single-use vial, along with the used disposable supplies, in the sharps or other container (Figure 14) as recommended by your healthcare professional.
- Clean and store the infusion pump, following the manufacturer’s instructions.

Be sure to tell your doctor about any problems you have doing your infusions. Your doctor may ask to see your treatment diary or log book, so be sure to take it with you each time you visit the doctor’s office.

Call your doctor for medical advice about side effects. You can also report side effects to FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

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