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

INJECTAFER® (ferric carboxymaltose injection), for intravenous use
Initial U.S. Approval: 2013

INDICATIONS AND USAGE
Injectafer is an iron replacement product indicated for the treatment of iron deficiency anemia in adult patients:
• who have intolerance to oral iron or have had unsatisfactory response to oral iron;
• who have non-dialysis dependent chronic kidney disease.

DOSAGE AND ADMINISTRATION
For patients weighing 50 kg (110 lb) or more: Give Injectafer in two doses separated by at least 7 days. Give each dose as 750 mg for a total cumulative dose of 1500 mg of iron per course.
For patients weighing less than 50 kg (110 lb): Give Injectafer in two doses separated by at least 7 days and give each dose as 15 mg/kg body weight.
Injectafer treatment may be repeated if iron deficiency anemia reoccurs. (2)

DOSE FORMS AND STRENGTHS
Injection: 750 mg iron / 15 mL single-dose vial. (3)
In the 24 hours following administration of Injectafer, laboratory assays may overestimate serum iron and transferrin bound iron by also measuring the iron in Injectafer.

6 ADVERSE REACTIONS

The following adverse reactions are discussed in greater detail in other sections of the labeling:

- Hypersensitivity Reactions [see Warnings and Precautions (5.1)]
- Hypertension [see Warnings and Precautions (5.2)]
- Laboratory Test Alterations [see Warnings and Precautions (5.3)]
- Injection Site Reactions (5.6)
- Use in Specific Populations (8)
- Pregnancy (8.1)
- Pediatric Use (8.4)
- Geriatric Use (8.5)
- Use in Specific Populations (8.1)
- Pregnancy

6.1 Adverse Reactions in Clinical Trials

Because clinical trials are conducted under widely varying conditions, the adverse reaction rates observed cannot be directly compared to rates in other clinical trials and may not reflect the rates observed in clinical practice.

In two randomized clinical studies [Studies 1 and 2, see Clinical Studies (14)], a total of 1,775 patients were exposed to Injectafer 15 mg/kg body weight up to a maximum single dose of 750 mg of iron on two occasions separated by at least 7 days up to a cumulative dose of 1500 mg of iron.

Adverse reactions reported by ≥ 1% of treated patients are shown in the following table.

<table>
<thead>
<tr>
<th>Term</th>
<th>Injectafer (N=1775) %</th>
<th>Poolled Comparators a (N=1795) %</th>
<th>Oral iron (N=253) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nausea</td>
<td>7.2</td>
<td>1.8</td>
<td>1.2</td>
</tr>
<tr>
<td>Hypertension</td>
<td>3.8</td>
<td>1.9</td>
<td>0.4</td>
</tr>
<tr>
<td>Flushing/Hot Flush</td>
<td>3.6</td>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Blood Phosphorus Decrease</td>
<td>2.1</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Dizziness</td>
<td>2.0</td>
<td>1.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Vomiting</td>
<td>1.7</td>
<td>0.5</td>
<td>0.4</td>
</tr>
<tr>
<td>Injection Site Discoloration</td>
<td>1.4</td>
<td>0.3</td>
<td>0.0</td>
</tr>
<tr>
<td>Headache</td>
<td>1.2</td>
<td>0.9</td>
<td>0.0</td>
</tr>
<tr>
<td>Alanine Aminotransferase Increase</td>
<td>1.1</td>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Dysgeusia</td>
<td>1.1</td>
<td>2.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Hypotension</td>
<td>1.0</td>
<td>1.9</td>
<td>0.0</td>
</tr>
<tr>
<td>Constipation</td>
<td>0.5</td>
<td>0.9</td>
<td>3.2</td>
</tr>
</tbody>
</table>

a Includes oral iron and all formulations of IV iron other than Injectafer

Other adverse reactions reported by ≥ 0.5% of treated patients include abdominal pain, diarrhea, gamma glutamyl transferase increased, injection site pain/irritation, rash, paraesthesia, sneezing. Transient decreases in laboratory blood phosphorus levels (<2 mg/DL) have been observed in 27% (440/1638) patients in clinical trials.

6.2 Post-marketing Experience

Because these reactions are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency or establish a causal relationship to drug exposure. The following serious adverse reactions have been most commonly reported from the post-marketing spontaneous reports with Injectafer: urticaria, dyspnea, pruritis, tachycardia, erythema, pyrexia, chest discomfort, chills, angioedema, back pain, arthralgia, and syncope. One case of hypophosphatemic osteomalacia was reported in a subject who received 500 mg of Injectafer every 2 weeks for a total of 16 weeks. Partial recovery followed discontinuation of Injectafer.

8 USE IN SPECIFIC POPULATIONS

8.1 Pregnancy

Risk Summary

Published studies on the use of ferric carboxymaltose in pregnant women have not reported an association with ferric carboxymaltose and adverse developmental outcomes. However, these studies cannot establish or exclude the absence of any drug-related risk during pregnancy because of methodological limitations, including that the studies were not primarily designed to capture safety data nor designed to assess the risk of major birth defects. Maternal adverse events reported in these studies are similar to those reported during clinical trials in adult males and non-pregnant females [see Adverse Reactions (6.1)].

Animal Data

Administration of ferric carboxymaltose to rats as a one-hour intravenous infusion up to 30 mg/kg/day iron on gestation days 6 to 17 did not result in adverse embryonic or fetal findings. This daily dose in rats is approximately 40% of the human weekly dose of 750 mg based on body surface area. In rabbits, ferric carboxymaltose was administered as a one-hour infusion on gestation days 6 to 19 at iron doses of 4.5, 9, 13.5, and 18 mg/kg/day. Malformations were seen starting at the daily dose of 9 mg/kg (23% of the human weekly dose of 750 mg). Spontaneous abortions occurred starting at the daily iron dose of 4.5 mg/kg (12% of the human weekly dose based on body surface area). Pre-implantation loss was at the highest dose. Adverse embryonic or fetal effects were observed in the presence of maternal toxicity.

A pre- and post-natal development study was conducted in rats at intravenous doses up to 18 mg/kg/day of iron (approximately 23% of the weekly human dose of 750 mg on a body surface area basis). There were no adverse effects on survival of offspring, their behavior, sexual maturation or reproductive parameters.

Clinical Considerations

Disease-Associated Maternal and/or Embryo/Fetal Risk

Untreated iron deficiency anemia (IDA) in pregnancy is associated with adverse maternal outcomes such as pre-partum anemia. Adverse pregnancy outcomes associated with IDA include increased risk for preterm delivery and low birth weight.

8.2 Lactation

Risk Summary

The available published data on the use of ferric carboxymaltose in lactating women demonstrate that iron is present in breast milk. However, the data do not inform the full potential exposure of iron for the breastfed infant. Among the breastfed infants, there were no adverse events reported that were considered related to ferric carboxymaltose exposure through breastmilk. There is no information on the effects of ferric carboxymaltose on milk production. The developmental and health benefits of breastfeeding should be considered along with the mother’s clinical need for Injectafer in addition to any potential adverse effects on the breastfed child from the drug or from the underlying maternal condition.

Clinical Considerations

Monitor breastfed infants for gastrointestinal toxicity (constipation, diarrhea).

8.4 Pediatric Use

Safety and effectiveness have not been established in pediatric patients.

8.5 Geriatric Use

Of the 1775 subjects in clinical studies of Injectafer, 50% were 65 years or over, while 25% were 75 years and over. No overall differences in safety or effectiveness were observed between these subjects and younger subjects, and other reported clinical experience has not identified differences in responses between the elderly and younger patients, but greater sensitivity of some older individuals cannot be ruled out.

10 OVERDOSAGE

Excessive dosages of Injectafer may lead to accumulation of iron in storage sites potentially leading to hemosiderosis. A patient who received Injectafer 18,000 mg over 6 months developed hemosiderosis with multiple joint disorder, walking disability and asthenia. Hypophosphatemic osteomalacia was reported in a patient who received Injectafer 4000 mg over 4 months. Partial recovery followed discontinuation of Injectafer. [see Adverse Reactions (6.2)].

11 DESCRIPTION

Ferric carboxymaltose, an iron replacement product, is an iron carbohydrate complex with the chemical name of polymeric iron (III) hydroxide 4(R)-(poly-(1→4)-D-glucopyranosyl)-oxy-2(R),3(S),5(R),6-tetrahydroxy-hexanoate. It has a relative molecular weight of approximately 150,000 Da corresponding to the following empirical formula:

\[\text{FeO}_{4}D_{m}H_{2}O_{n}\approx(NUH_{2}O_{5})_{k}\] where \(n=1^{2}m=8, l=11, k=4\) (represents the mean branching degree of the ligand).
The chemical structure is presented below:

Injectafer (ferric carboxymaltose injection) is a dark brown, sterile, aqueous, isotonie colloidal solution for intravenous injection. Each mL contains 50 mg iron as ferric carboxymaltose in water for injection. Injectafer is available in 15 mL single-use vials. Sodium hydroxide and/or hydrochloric acid may have been added to adjust the pH to 5.0–7.0.

Vial closure is not made with natural rubber latex.

12 CLINICAL PHARMACOLOGY

12.1 Mechanism of Action
Ferric carboxymaltose is a colloidal iron (III) hydroxide in complex with carboxymaltose, a carbohydrate polymer that releases iron.

12.2 Pharmacodynamics
Using positron emission tomography (PET) it was demonstrated that red cell uptake of $^{59}$Fe and $^{52}$Fe from Injectafer ranged from 61% to 99%. In patients with iron deficiency, red cell uptake of radio-labeled iron ranged from 91% to 99% at 24 days after Injectafer dose. In patients with renal anemia red cell uptake of radio-labeled iron ranged from 61% to 84% after 24 days Injectafer dose.

12.3 Pharmacokinetics
After administration of a single dose of Injectafer of 100 to 1000 mg of iron in iron deficient patients, maximum iron concentration of 37 µg/mL to 335 µg/mL were obtained respectively after 15 minutes to 1.21 hours post dose. The volume of distribution was estimated to be 3 L.

The iron injected or infused was rapidly cleared from the plasma, the terminal half-life ranged from 7 to 12 hours. Renal elimination of iron was negligible.

13 NONCLINICAL TOXICOLOGY

13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility
Carcinogenicity studies have not been performed with ferric carboxymaltose.

Ferric carboxymaltose was not genotoxic in the following genetic toxicity studies: in vitro microbial mutagenesis Ames assay, in vitro chromosome aberration test in human lymphocytes, in vitro mammalian cell mutation assay in mouse lymphoma LS178Y/TK+/- cells, in vivo mouse micronucleus test at single intravenous doses up to 500 mg/kg.

In a combined male and female fertility study, ferric carboxymaltose was administered intravenously over one hour to male and female rats at iron doses of up to 30 mg/kg. Animals were dosed 3 times per week (on Days 0, 3, and 7). There was no effect on mating function, fertility or early embryonic development. The dose of 30 mg/kg in animals is approximately 40% of the human dose of 750 mg based on body surface area.

14 CLINICAL STUDIES

The safety and efficacy of Injectafer for treatment of iron deficiency anemia were evaluated in two randomized, open-label, controlled clinical trials (Trial 1 and Trial 2). In these two trials, Injectafer was administered at a dose of 15 mg/kg body weight up to a maximum single dose of 750 mg of iron on two occasions separated by at least 7 days up to a cumulative dose of 1500 mg of iron.

14.1 Trial 1: Iron Deficiency Anemia in Patients Who Are Intolerant to Oral Iron or Have Had Unsatisfactory Response to Oral Iron
Trial 1: A Multi-center, Randomized, Active Controlled Study to Investigate the Efficacy and Safety of Intravenous Ferric Carboxymaltose (FCM) in Patients with Iron Deficiency Anemia (IDA), (NCT00982007) was a randomized, open-label, controlled clinical study in patients with iron deficiency anemia who had an unsatisfactory response to oral iron (Cohort 1) or who were intolerant to oral iron (Cohort 2) during the 14 day oral iron run-in period. Inclusion criteria prior to randomization included hemoglobin (Hb) $\leq 12$ g/dL, ferritin $\leq 100$ ng/mL or ferritin $\leq 300$ ng/mL when transferrin saturation (TSAT) $\leq 30%$. Cohort 1 subjects were randomized to Injectafer or oral iron for 14 more days. Cohort 2 subjects were randomized to Injectafer or another IV iron per standard of care (90% of subjects received Injectafer). The mean age of study patients was 43 years (range, 18 to 94): 94% were female; 42% were Caucasian, 32% were African American, 24% were Hispanic, and 2% were other races. The primary etiologies of iron deficiency anemia were heavy uterine bleeding (47%) and gastrointestinal disorders (17%).

Table 2 shows the baseline and the change in hemoglobin from baseline to highest value between baseline and Day 35 or time of intervention.

<table>
<thead>
<tr>
<th>Hemoglobin (g/dL)</th>
<th>Cohort 1</th>
<th>Cohort 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Injectafer</td>
<td>Oral Iron</td>
</tr>
<tr>
<td>Baseline</td>
<td>10.6 (1.0)</td>
<td>10.6 (1.0)</td>
</tr>
<tr>
<td>Highest Value</td>
<td>12.2 (1.1)</td>
<td>11.4 (1.2)</td>
</tr>
<tr>
<td>Change (from baseline to highest value)</td>
<td>1.6 (1.2)</td>
<td>0.8 (0.8)</td>
</tr>
<tr>
<td>p-value</td>
<td>0.001</td>
<td>0.001</td>
</tr>
</tbody>
</table>

SD=standard deviation; IV=Intravenous iron per standard of care

Increases from baseline in mean ferritin (264.2 ± 224.2 ng/mL in Cohort 1 and 218.2 ± 211.4 ng/mL in Cohort 2), and transferrin saturation (13 ± 16% in Cohort 1 and 20 ± 15% in Cohort 2) were observed at Day 35 in Injectafer-treated patients.

14.2 Trial 2: Iron Deficiency Anemia in Patients with Non-Dialysis Dependent Chronic Kidney Disease
Trial 2: REPAIR-IDA, Randomized Evaluation of efficacy and safety of Ferric carboxymaltose in Patients with iron deficiency Anemia and Impaired Renal function, (NCT00981045) was a randomized, open-label, controlled clinical study in patients with non-dialysis dependent chronic kidney disease. Inclusion criteria included hemoglobin (Hb) $\leq 11.5$ g/dL, ferritin $\leq 100$ ng/mL or ferritin $\leq 300$ ng/mL when transferrin saturation (TSAT) $\leq 30%$. Study patients were randomized to either Injectafer or Venofer. The mean age of study patients was 67 years (range, 19 to 96): 64% were female; 54% were Caucasian, 26% were African American, 18% Hispanics, and 2% were other races.

Table 3 shows the baseline and the change in hemoglobin from baseline to highest value between baseline and Day 56 or time of intervention.

<table>
<thead>
<tr>
<th>Hemoglobin (g/dL)</th>
<th>Baseline</th>
<th>Change (from baseline to highest value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Injectafer</td>
<td>Venofer</td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>(N=1249)</td>
<td>(N=1244)</td>
</tr>
<tr>
<td>Baseline</td>
<td>10.3 (0.8)</td>
<td>10.3 (0.8)</td>
</tr>
<tr>
<td>Highest Value</td>
<td>11.4 (1.2)</td>
<td>11.3 (1.1)</td>
</tr>
<tr>
<td>Treatment Difference (95% CI)</td>
<td>0.1 (0.13, 0.28)</td>
<td></td>
</tr>
</tbody>
</table>

Increases from baseline in mean ferritin (734.7 ± 337.8 ng/mL), and transferrin saturation (30 ± 17%) were observed at Day 56 in Injectafer-treated patients.

16 HOW SUPPLIED/STORAGE AND HANDLING
NDC 0517-0650-01 750 mg iron/15 mL Single-Dose Vial Individually boxed
NDC 0517-0650-02 750 mg iron/15 mL Single-Dose Vial Packages of 2

Store at 20°C to 25°C (68°F to 77°F); excursions permitted to 15°C to 30°C (59°F to 86°F). [See the USP controlled room temperature]. Do not freeze.

17 PATIENT COUNSELING INFORMATION
• Question patients regarding any prior history of reactions to parenteral iron products.
• Advise patients of the risks associated with Injectafer.
• Advise patients to report any signs and symptoms of hypersensitivity that may develop during and following Injectafer administration, such as rash, itching, dizziness, lightheadedness, swelling and breathing problems [see Warnings and Precautions (5)].

Injectafer is manufactured under license from Vifor (International) Inc, Switzerland.

AMERICAN REGENT, INC.
SHIRLEY, NY 11967
IN0650-P
R01052
### What is INJECTAFER?

INJECTAFER is a prescription iron replacement medicine used to treat iron deficiency anemia in adults who have:

- intolerance to oral iron or who have not responded well to treatment with oral iron
- non-dialysis dependent chronic kidney disease

It is not known if INJECTAFER is safe and effective for use in children.

### Who should not receive INJECTAFER?

**Do not** receive INJECTAFER if you are allergic to ferric carboxymaltose or any of the ingredients in INJECTAFER. See the end of this leaflet for a complete list of ingredients in INJECTAFER.

**Before receiving INJECTAFER,** tell your healthcare provider about all of your medical conditions, including if you:

- have had an allergic reaction to iron given into your vein
- have high blood pressure
- are pregnant or plan to become pregnant. It is not known if INJECTAFER will harm your unborn baby.
- are breastfeeding or plan to breastfeed. INJECTAFER passes into your breast milk. It is unknown whether INJECTAFER would pose a risk to your baby. Talk to your healthcare provider about the best way to feed your baby during treatment with INJECTAFER.

Tell your healthcare provider about all the medicines you take, including prescription and over-the-counter medicines, vitamins, and herbal supplements.

### How will I receive INJECTAFER?

INJECTAFER is given intravenously (into your vein) by your healthcare provider in 2 doses at least 7 days apart.

### What are the possible side effects of INJECTAFER?

INJECTAFER may cause serious side effects, including:

- **Allergic (hypersensitivity) reactions.** Serious life-threatening allergic reactions have happened in people who receive INJECTAFER. Other serious reactions including itching, hives, wheezing, and low blood pressure also have happened during treatment with INJECTAFER. Tell your healthcare provider if you have ever had any unusual or allergic reaction to any iron given by vein.

- **High blood pressure (hypertension).** High blood pressure, sometimes with face flushing, dizziness, or nausea, has happened during treatment with INJECTAFER. Your healthcare provider will check your blood pressure and check for any signs and symptoms of high blood pressure after you receive INJECTAFER.

The most common side effects of INJECTAFER include:

- nausea
- flushing
- low levels of phosphorous in your blood
- dizziness

These are not all the possible side effects of INJECTAFER.

Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

### General information about INJECTAFER

Medicines are sometimes prescribed for purposes other than those listed in a Patient Information leaflet. You can ask your pharmacist or healthcare provider for information about INJECTAFER that is written for health professionals.

### What are the ingredients in INJECTAFER?

**Active ingredient:** ferric carboxymaltose

**Inactive ingredients:** water for injection. Sodium hydroxide and/or hydrochloric acid may have been added to adjust pH to 5.0-7.0.

For more information go to www.injectafer.com or call 1-800-734-9236.

This Patient Information has been approved by the U.S. Food and Drug Administration.

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