

1 **HIGHLIGHTS OF PRESCRIBING INFORMATION**

2 **These highlights do not include all the information needed to use HYPERRAB<sup>®</sup> safely**  
3 **and effectively. See full prescribing information for HYPERRAB**

4 **HYPERRAB[rabies immune globulin (human)]solution for infiltration and**  
5 **intramuscular injection**

6 **Initial U.S. Approval: 1974**

7

8 **INDICATIONS AND USAGE**

9 HYPERRAB is a human rabies immune globulin indicated for postexposure prophylaxis,  
10 along with rabies vaccine, for all persons suspected of exposure to rabies. (1)

11 Limitations of Use

12 Persons previously immunized with rabies vaccine that have a confirmed adequate rabies  
13 antibody titer should receive only vaccine.

14 For unvaccinated persons, the combination of HYPERRAB and vaccine is recommended for  
15 both bite and nonbite exposures regardless of the time interval between exposure and  
16 initiation of post-exposure prophylaxis.

17 Beyond 7 days (after the first vaccine dose), HYPERRAB is not indicated since an antibody  
18 response to vaccine is presumed to have occurred.

19 **DOSAGE AND ADMINISTRATION**

20 **For infiltration and intramuscular use only.**

21 **Administer HYPERRAB within 7 days after the first dose of rabies vaccine.**

Postexposure prophylaxis, along with rabies vaccine, after suspected exposure to rabies (2.1)	HYPERRAB 20 IU/kg body weight OR 0.0665 mL/kg body weight  Single dose	<ul style="list-style-type: none"><li>• Administer as soon as possible after exposure, preferably at the time of the first rabies vaccine dose.</li><li>• Infiltrate the full dose of HYPERRAB thoroughly in the area around and into the wound(s), if anatomically feasible,</li><li>• Inject the remainder, if any, intramuscularly.</li></ul>
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23 **DOSAGE FORMS AND STRENGTHS**

24 300 IU/mL solution for injection supplied in 1 mL and 5 mL single-dose vials. (3)

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## CONTRAINDICATIONS

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None. (4)

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## WARNINGS AND PRECAUTIONS

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• Severe hypersensitivity reactions, including anaphylaxis, may occur with HYPERRAB. Have epinephrine available immediately to treat any acute severe hypersensitivity reactions. (5.1)

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• HYPERRAB 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. (5.2)

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## ADVERSE REACTIONS

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The most common adverse reactions in >5% of subjects in clinical trials were injection site pain, headache, injection site nodule, abdominal pain, diarrhea, flatulence, nasal congestion, and oropharyngeal pain. (6.1)

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**To report SUSPECTED ADVERSE REACTIONS, contact Grifols Therapeutics LLC at 1-800-520-2807 or FDA at 1-800-FDA-1088 or [www.fda.gov/medwatch](http://www.fda.gov/medwatch).**

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## DRUG INTERACTIONS

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• Repeated dosing after administration of rabies vaccine may suppress the immune response to the vaccine. (7)

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• Defer live vaccine (measles, mumps, rubella) administration for 4 months. (7)

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**See 17 for Patient Counseling Information.**

**Revised: 2/2018**

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79 \* Sections or subsections omitted from the Full Prescribing Information are not listed.

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80 **FULL PRESCRIBING INFORMATION**

81 **1 INDICATIONS AND USAGE**

82 HYPERRAB is a human rabies immune globulin indicated for postexposure prophylaxis,  
83 along with rabies vaccine, for all persons suspected of exposure to rabies.

84 Limitation of Use

85 Persons who have been previously immunized with rabies vaccine and have a confirmed  
86 adequate rabies antibody titer should receive only vaccine.<sup>1-3</sup>

87 For unvaccinated persons, the combination of HYPERRAB and vaccine is recommended for  
88 both bite and nonbite exposures regardless of the time interval between exposure and  
89 initiation of post-exposure prophylaxis.<sup>1-3</sup>

90 Beyond 7 days (after the first vaccine dose), HYPERRAB is not indicated since an antibody  
91 response to vaccine is presumed to have occurred.

92 **2 DOSAGE AND ADMINISTRATION**

93 **For infiltration and intramuscular use only.**

94 **The strength of HYPERRAB is 300 IU/mL.**

95 **2.1 Dose**

96 Use HYPERRAB in combination with rabies vaccine series to be effective. Do not use  
97 HYPERRAB alone for prevention.

98 Administer HYPERRAB within 7 days after the first dose of rabies vaccine.

**Rabies Postexposure Prophylaxis Schedule\***

<b>Vaccination Status</b>	<b>Treatment</b>	<b>Regimen<sup>†</sup></b>
Not previously vaccinated	Wound cleansing	<ul style="list-style-type: none"><li>• Cleanse all wounds immediately and thoroughly with soap and water.</li><li>• Irrigate the wounds with a virucidal agent such as a povidone-iodine solution, if available.</li></ul>

### Rabies Postexposure Prophylaxis Schedule\*

Vaccination Status	Treatment	Regimen <sup>†</sup>
	<p>HYPERRAB 20 IU/kg body weight OR 0.0665 mL/kg body weight</p> <p>Single dose</p>	<ul style="list-style-type: none"> <li>• Administer HYPERRAB as soon as possible after exposure, preferably at the time of the first vaccine dose.</li> <li>• Infiltrate the full dose of HYPERRAB thoroughly in the area around and into the wound(s), if anatomically feasible. <i>[see Dosage and Administration (2.3)]</i></li> <li>• Inject the remainder, if any, intramuscularly at an anatomical site distant from the site of vaccine administration. <i>[see Dosage and Administration (2.3)]</i></li> <li>• Do not exceed the recommended dose of HYPERRAB, otherwise the active production of rabies antibody may be partially suppressed. <i>[see Drug Interactions (7)]</i></li> <li>• Use separate syringes, needles, and anatomical injection sites for HYPERRAB and for rabies vaccine.</li> </ul>
	Rabies Vaccine	<ul style="list-style-type: none"> <li>• Administer rabies vaccine on day 0<sup>‡</sup>.</li> <li>• Complete a rabies vaccination series for previously unvaccinated persons.</li> </ul>
Previously vaccinated <sup>§</sup>	Wound cleansing	<ul style="list-style-type: none"> <li>• Cleanse all wounds immediately and thoroughly with soap and water.</li> <li>• Irrigate the wounds with a virucidal agent such as a povidone-iodine solution, if available.</li> </ul>
	HYPERRAB	<ul style="list-style-type: none"> <li>• Do not administer HYPERRAB. <i>[see Indications and Usage (1)]</i></li> </ul>
	Rabies Vaccine	<ul style="list-style-type: none"> <li>• Administer rabies vaccine on day 0<sup>‡</sup>.</li> <li>• Complete a rabies vaccination series for previously vaccinated persons.<sup>†</sup></li> </ul>

\* Adapted from reference 1.

<sup>†</sup> These regimens are applicable for all age groups, including children.

<sup>‡</sup> Day 0 is the day the first dose of vaccine is administered. Refer to vaccine manufacturer's instructions or to the recommendations of the Advisory Committee on Immunization Practices (ACIP)<sup>1,3</sup> for appropriate rabies vaccine formulations, schedules and dosages.

<sup>§</sup> Any person with a history of rabies vaccination and a documented history of antibody response to the prior vaccination.

## 99 2.2 Preparation

- 100 • Calculate the volume of HYPERRAB for the recommended dose of 20 IU/kg.  
101

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- 103 • Ensure the correct strength is used for the calculation. HYPERRAB is formulated with a  
104 strength of 300 IU/mL. The predecessor product, HYPERRAB S/D was formulated at  
105 150 IU/mL. The volume required of HYPERRAB (300 IU/mL) to achieve the  
106 recommended dose of 20 IU/kg is approximately one half of that required for the  
107 previous HYPERRAB S/D (150 IU/mL).
- 108 • Visually inspect parenteral drug products for particulate matter and discoloration prior to  
109 administration, whenever solution and container permit. HYPERRAB is a clear or  
110 slightly opalescent, and colorless or pale yellow or light brown sterile solution.
- 111 • Do not use HYPERRAB if the product shows any sign of tampering. Notify Grifols  
112 Therapeutics LLC immediately [1-800-520-2807].
- 113 • Do not freeze. Do not use any solution that has been frozen.

114

### 115 **2.3 Administration**

- 116 • Administer HYPERRAB at the time of the first vaccine dose (day 0), but no later than  
117 day 7.<sup>1-3</sup>
- 118 • Infiltrate the full dose of HYPERRAB in the area around the wound, if anatomically  
119 feasible. Dilute HYPERRAB with an equal volume of dextrose, 5% (D5W), if additional  
120 volume is needed to infiltrate the entire wound. Do not dilute with normal saline.
- 121 • Inject the remainder, if any, of the HYPERRAB dose intramuscularly into the deltoid  
122 muscle of the upper arm or into the lateral thigh muscle, and distant from the site of  
123 vaccine administration.
- 124 • Do not administer HYPERRAB in the same syringe or needle or in the same anatomic  
125 site as vaccine.

126

## 127 **3 DOSAGE FORMS AND STRENGTHS**

128 HYPERRAB is a sterile, 300 IU/mL solution for injection supplied in 1 mL and 5 mL single-  
129 dose vials. The 1 mL vial is sufficient for a child weighing 15 kg. The 5 mL vial is sufficient  
130 for an adult weighing 75 kg.

131 HYPERRAB is standardized against the U.S. Standard Rabies Immune Globulin to contain a  
132 potency of  $\geq 300$  IU/mL. The U.S. unit of potency is equivalent to the international unit (IU)  
133 for rabies antibody.

## 134 **4 CONTRAINDICATIONS**

135 None.

136 **5 WARNINGS AND PRECAUTIONS**

137 **5.1 Hypersensitivity Reactions**

138 Severe hypersensitivity reactions may occur with HYPERRAB. Patients with a history of  
139 prior systemic allergic reactions to human immunoglobulin preparations are at a greater risk  
140 of developing severe hypersensitivity and anaphylactic reactions. Have epinephrine available  
141 for treatment of acute allergic symptoms, should they occur.

142 Patients with isolated immunoglobulin A (IgA) deficiency may develop severe  
143 hypersensitivity reactions to HYPERRAB, or subsequently, to the administration of blood  
144 products that contain IgA.

145 **5.2 Transmissible Infectious Agents**

146 HYPERRAB is made from human blood and may carry a risk of transmitting infectious  
147 agents, e.g., viruses, the variant Creutzfeldt-Jakob disease (vCJD) agent, and, theoretically,  
148 the Creutzfeldt-Jakob disease (CJD) agent. HYPERRAB is purified from human plasma  
149 obtained from healthy donors. When medicinal biological products are administered,  
150 infectious diseases due to transmission of pathogens cannot be totally excluded. However, in  
151 the case of products prepared from human plasma, the risk of transmission of pathogens is  
152 reduced by: (1) epidemiological controls on the donor population and selection of individual  
153 donors by a medical interview and screening of individual donations and plasma pools for  
154 viral infection markers; (2) testing of plasma for hepatitis C virus (HCV), human  
155 immunodeficiency virus (HIV), hepatitis B virus (HBV), HAV and human parvovirus  
156 (B19V) genomic material; and (3) manufacturing procedures with demonstrated capacity to  
157 inactivate/remove pathogens.

158 ALL infections thought by a physician possibly to have been transmitted by this product  
159 should be reported by the physician or other healthcare provider to Grifols Therapeutics LLC  
160 [1-800-520-2807].

161 **6 ADVERSE REACTIONS**

162 The most common adverse reactions in >5% of subjects during clinical trials were injection  
163 site pain, headache, injection site nodule, abdominal pain, diarrhea, flatulence, nasal  
164 congestion, and oropharyngeal pain.

165 **6.1 Clinical Trials Experience**

166 Because clinical trials are conducted under widely varying conditions, adverse reaction rates  
167 observed in the clinical trials of a drug cannot be directly compared to rates in the clinical  
168 trials of another drug and many not reflect the rates observed in practice.

169

170 The new formulation for HYPERRAB is manufactured using caprylate/chromatography  
171 purification and has a rabies antibody concentration of 300 IU/mL. The previous  
172 formulation, HYPERRAB S/D, was manufactured using a solvent detergent process and had  
173 a rabies antibody concentration of 150 IU/mL. These products were evaluated in 2 clinical  
174 trials in a total of 20 healthy subjects using a 20 IU/kg single dose. The initial study  
175 evaluated the original 150 IU/mL HYPERRAB S/D in 8 subjects and the second study  
176 evaluated HYPERRAB in 12 subjects. The original study of HYPERRAB S/D reported  
177 headache (1/8; 13%).

178 In the study with HYPERRAB at 300 IU/mL, 5 subjects (5/12; 42%) experienced at least 1  
179 adverse reaction. These were: injection site pain (4/12; 33%), injection site nodule (1/12;  
180 8%), abdominal pain (1/12; 8%), diarrhea (1/12; 8%), flatulence (1/12; 8%), headache (1/12;  
181 8%), nasal congestion (1/12; 8%), and oropharyngeal pain (1/12; 8%).

## 182 **6.2 Postmarketing Experience**

183 There are no data on the postmarketing use of HyperRAB (300 IU/mL). The following  
184 adverse reactions have been identified during post approval use of the predecessor  
185 formulation, HYPERRAB S/D. Because these reactions are reported voluntarily from a  
186 population of uncertain size, it is not always possible to reliably estimate their frequency or  
187 establish a causal relationship to drug exposure.

188 Among patients treated with HYPERRAB S/D, cases of allergic/hypersensitivity reactions  
189 including anaphylaxis have been reported. Soreness at the site of injection (injection site  
190 pain) may be observed following intramuscular injection of immune globulins. Sensitization  
191 to repeated injections has occurred occasionally in immunoglobulin-deficient patients.

192 The following have been identified as the most frequently reported post-marketing adverse  
193 reactions:

194 Immune system disorder	Anaphylactic reaction*,
195	Hypersensitivity*
196 Nervous system disorders	Hypoesthesia
197 Gastrointestinal disorders	Nausea
198 Musculoskeletal and connective tissue disorders	Arthralgia, myalgia, pain in extremity

199 \* These reactions have been manifested by dizziness, paresthesia, rash, flushing, dyspnea,  
200 tachypnea, oropharyngeal pain, hyperhidrosis, and erythema

201

## 202 **7 DRUG INTERACTIONS**

- 203 • Do not administer repeated doses of HYPERRAB once vaccine treatment has been  
204 initiated as this could prevent the full expression of active immunity expected from the  
205 rabies vaccine.<sup>1</sup>



- 206 • Other antibodies in the HYPERRAB preparation may interfere with the response to live  
207 vaccines such as measles, mumps, polio or rubella. Defer immunization with live  
208 vaccines for 4 months after HYPERRAB administration.<sup>5</sup>

## 209 **8 USE IN SPECIFIC POPULATIONS**

### 210 **8.1 Pregnancy**

#### 211 Risk Summary

212 There are no data with HYPERRAB use in pregnant women to inform a drug-associated risk.  
213 Animal reproduction studies have not been conducted with HYPERRAB. It is not known  
214 whether HYPERRAB can cause fetal harm when administered to a pregnant woman or can  
215 affect reproduction capacity. HYPERRAB should be given to a pregnant woman only if  
216 clearly needed. In the U.S. general population, the estimated background risk of major birth  
217 defect and miscarriage in clinically recognized pregnancies is 2-4% and 15-20%,  
218 respectively.

### 219 **8.2 Lactation**

#### 220 Risk Summary

221 There is no information regarding the presence of HYPERRAB in human milk, the effect on  
222 the breastfed infant, or the effects on milk production. The developmental and health benefits  
223 of breastfeeding should be considered along with the mother's clinical need for HYPERRAB  
224 and any potential adverse effects on the breastfed infant from HYPERRAB.

### 225 **8.4 Pediatric Use**

226 Safety and effectiveness in pediatric patients have not been established.

### 227 **8.5 Geriatric Use**

228 Safety and effectiveness in geriatric population have not been established.

## 229 **10 OVERDOSAGE**

230 Because Rabies Immune Globulin (Human) may partially suppress active production of  
231 antibody in response to the rabies vaccine, do not give more than the recommended dose of  
232 rabies immune globin (human).<sup>1</sup>

## 233 **11 DESCRIPTION**

234 HYPERRAB is a clear or slightly opalescent, and colorless or pale yellow or light brown  
235 sterile solution of human antirabies immune globulin for intramuscular administration.  
236 HYPERRAB contains no preservative. HYPERRAB is prepared from pools of human  
237 plasma collected from healthy donors (hyperimmunized with rabies vaccine) by a  
238 combination of cold ethanol fractionation, caprylate precipitation and filtration, caprylate

239 incubation, anion-exchange chromatography, nanofiltration and low pH incubation.  
240 HYPERRAB consists of 15 to 18% protein at pH 4.1 to 4.8 in 0.16 to 0.26 M glycine. The  
241 product is standardized against the U.S. Standard Rabies Immune Globulin to contain a  
242 potency value of not less than 300 IU/mL. The U.S. unit of potency is equivalent to the  
243 international unit (IU) for rabies antibody.

244 When medicinal biological products are administered, infectious diseases due to transmission  
245 of pathogens cannot be totally excluded. However, in the case of products prepared from  
246 human plasma, the risk of transmission of pathogens is reduced by epidemiological  
247 surveillance of the donor population and selection of individual donors by medical interview;  
248 testing of individual donations and plasma pools; and the presence in the manufacturing  
249 processes of steps with demonstrated capacity to inactivate/remove pathogens.

250 In the manufacturing process of HYPERRAB, there are several steps with the capacity for  
251 virus inactivation or removal.<sup>6</sup> The main steps of the manufacturing process that contribute to  
252 the virus clearance capacity are as follows:

- 253 • Caprylate precipitation/depth filtration
- 254 • Caprylate incubation
- 255 • Depth filtration
- 256 • Column chromatography
- 257 • Nanofiltration
- 258 • Low pH final container incubation

259

260 To provide additional assurance of the pathogen safety of the final product, the capacity of  
261 the HYPERRAB manufacturing process to remove and/or inactivate viruses has been  
262 demonstrated by laboratory spiking studies on a scaled down process model using a wide  
263 range of viruses with diverse physicochemical properties.

264 The combination of all of the above mentioned measures provides the final product with a  
265 high margin of safety from the potential risk of transmission of infectious viruses.

266 The caprylate/chromatography manufacturing process was also investigated for its capacity  
267 to decrease the infectivity of an experimental agent of transmissible spongiform  
268 encephalopathy (TSE), considered as a model for the variant Creutzfeldt-Jakob disease  
269 (vCJD), and Creutzfeldt-Jakob disease (CJD) agents.<sup>6</sup> These studies provide reasonable  
270 assurance that low levels of vCJD/CJD agent infectivity, if present in the starting material,  
271 would be removed by the caprylate/chromatography manufacturing process.

## 272 **12 CLINICAL PHARMACOLOGY**

### 273 **12.1 Mechanism of Action**

274 HYPERRAB provides immediate, passive, rabies virus neutralizing antibody coverage until  
275 the previously unvaccinated patient responds to rabies vaccine by actively producing  
276 antibodies.<sup>1</sup>

### 277 **12.2 Pharmacodynamics**

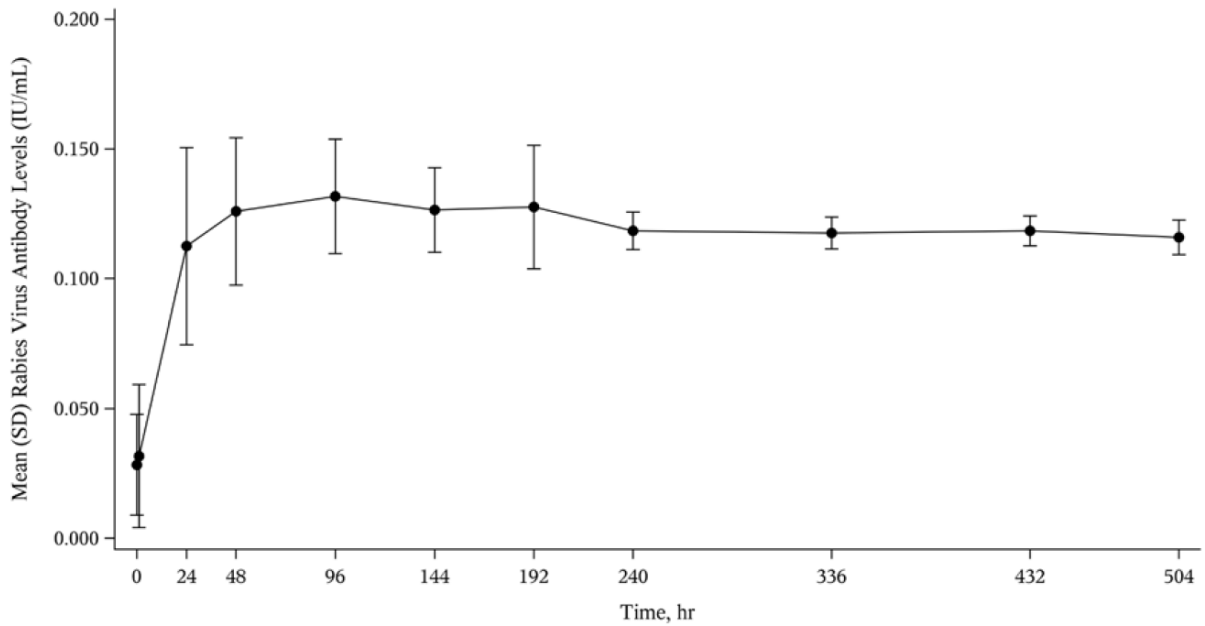
278 The usefulness of prophylactic rabies antibody in preventing rabies in humans when  
279 administered immediately after exposure was dramatically demonstrated in a group of  
280 persons bitten by a rabid wolf in Iran.<sup>7,8</sup> Similarly, beneficial results were later reported from  
281 the U.S.S.R.<sup>9</sup> Studies coordinated by WHO (World Health Organization) helped determine  
282 the optimal conditions under which antirabies serum of equine origin and rabies vaccine can  
283 be used in man.<sup>10-13</sup> These studies showed that antirabies serum can interfere to a variable  
284 extent with the active immunity induced by the vaccine, but could be minimized by booster  
285 doses of vaccine after the end of the usual dosage series.

286 Preparation of rabies immune globulin of human origin with adequate potency was reported  
287 by Cabasso et al.<sup>14</sup> In carefully controlled clinical studies, this globulin was used in  
288 conjunction with rabies vaccine of duck-embryo origin (DEV).<sup>14,15</sup> These studies determined  
289 that a human globulin dose of 20 IU/kg of rabies antibody, given simultaneously with the  
290 first DEV dose, resulted in amply detectable levels of passive rabies antibody 24 hours after  
291 injection in all recipients. The injections produced minimal, if any, interference with the  
292 subject's endogenous antibody response to DEV.

293 Subsequently, human diploid cell rabies vaccines (HDCV) prepared from tissue culture fluids  
294 containing rabies virus have received substantial clinical evaluation in Europe and the United  
295 States.<sup>14-22</sup> In a study in adult volunteers, the administration of Rabies Immune Globulin  
296 (Human) did not interfere with antibody formation induced by HDCV when given in a dose  
297 of 20 IU per kilogram body weight simultaneously with the first dose of vaccine.<sup>21</sup>

### 298 **12.3 Pharmacokinetics**

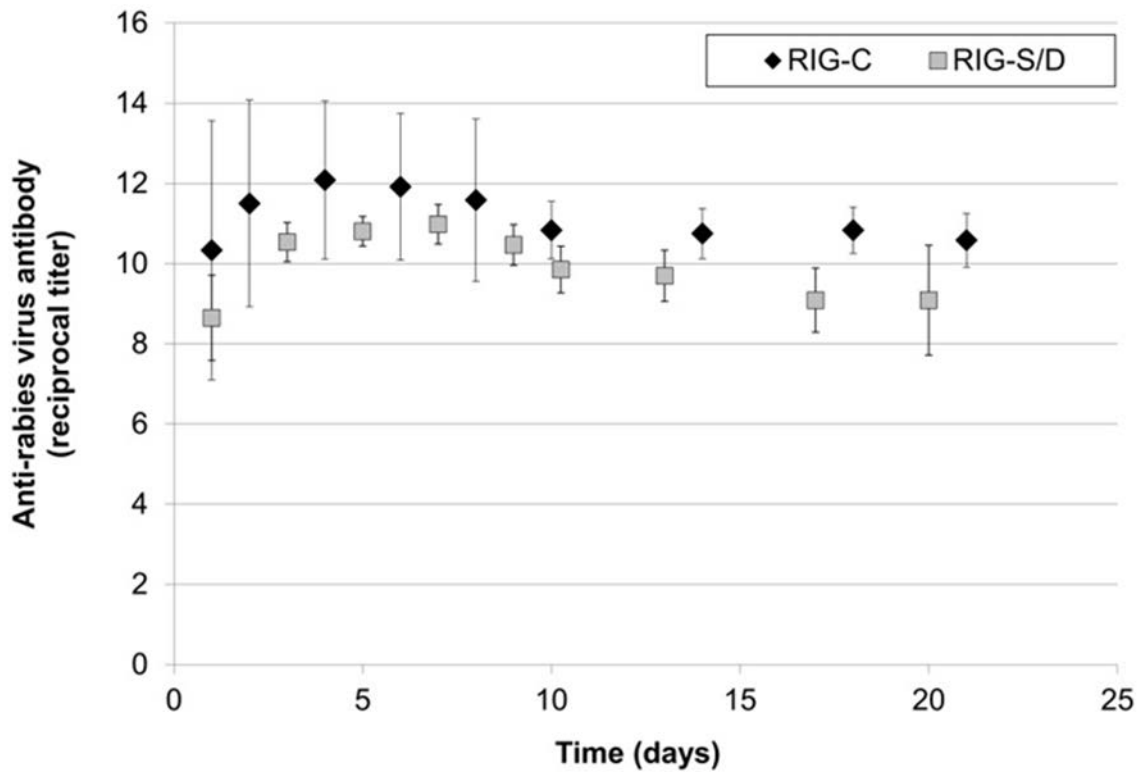
299 In a clinical study of 12 healthy human subjects receiving a 20 IU/kg intramuscular dose of  
300 HYPERRAB detectable passive rabies neutralizing antibody was present by 24 hours and  
301 persisted through the 21 day follow-up evaluation period. Figure 1 shows the mean levels of  
302 rabies virus antibodies in IU/mL across the 21 day evaluation period and indicates that the  
303 titer remains stable during this period. This level of passive rabies neutralizing antibody is  
304 similar to that reported in the literature for administration of human rabies immune globulin,  
305 and is clinically important because it provides interim protection until the host immune  
306 response to rabies vaccine produces definitive protective titers of neutralizing rabies antibody  
307 (therefore the rabies vaccine series is also essential).<sup>23-24</sup>



308

309 **Figure 1: Mean (Standard Deviation) Rabies Virus Neutralizing Antibody Levels**  
 310 **(IU/mL) versus Time following a Single 20 IU/kg Dose of HYPERRAB (300**  
 311 **IU/mL) by Intramuscular Injection**

312 The previous formulation, HYPERRAB S/D, was studied in 8 healthy subjects over 21 days.  
 313 As with the new formulation, rabies neutralizing antibody was present by 24 hours and  
 314 persisted through the 21 day follow up period (Figure 2).



315

316 **Figure 2: Reciprocal of Anti-Rabies Virus Neutralizing Antibody Titer Following**  
317 **a Single 20 IU/kg Dose of HYPERRAB (300 IU/mL; RIG-C) or HYPERRAB S/D**  
318 **(150 IU/mL; RIG-S/D) Product (mean [standard deviation])**

319

## 320 **14 CLINICAL STUDIES**

321 HYPERRAB was administered to a total of 20 healthy adult subjects in two clinical trials.  
322 [see *Clinical Pharmacology (12.3)*] A single intramuscular dose of 20 IU/kg HYPERRAB  
323 (12 subjects) or HYPERRAB S/D (8 subjects) was administered and rabies neutralizing  
324 antibody titers were monitored in serum for 21 days. Administration of both HYPERRAB  
325 formulations resulted in detectable titers of neutralizing antibodies to the rabies virus that  
326 persisted throughout the 21 day study period (Figure 2).

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395 **16 HOW SUPPLIED/STORAGE AND HANDLING**

396 HYPERRAB is supplied in 1 mL and 5 mL single dose vials with a potency value of not less  
 397 than 300 IU/mL.

398 HYPERRAB contains no preservative and is not made with natural rubber latex.

<u>NDC Number</u>	<u>Size</u>
13533-318-01	1 mL
13533-318-05	5 ml

- 399 • Store HYPERRAB at (2 to 8°C, 36 to 46°F).  
 400 • Do not freeze.  
 401 • Do not use after expiration date.

402  
 403 **17 PATIENT COUNSELING INFORMATION**

404 Discuss the risks and benefits of this product with the patient, before prescribing or  
 405 administering it to the patient.

406 Inform the patient who is allergic to human immune globulin products that severe, potentially  
 407 life-threatening allergic reactions could occur. *[see Warnings and Precautions (5.1)]*

408 Inform the patient who is deficient in IgA the potential for developing anti-IgA antibodies  
 409 and severe potentially life threatening allergic reactions. *[see Warnings and Precautions*  
 410 *(5.1)]*

411

412 Inform the patient that HYPERRAB is made from human plasma and may carry a risk of  
413 transmitting infectious agents that can cause disease. While the risk that HYPERRAB can  
414 transmit an infectious agent has been reduced by screening plasma donors for prior exposure,  
415 testing donated plasma, and including manufacturing steps with the capacity to inactivate  
416 and/or remove pathogens, the patient should report any symptoms that concern them. [*see*  
417 *Warnings and Precautions (5.2)*]

## GRIFOLS

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