

PRODUCT MONOGRAPH

GamaSTAN® S/D

Immune Globulin (Human)

Solvent/Detergent Treated

Injectable Solution, 15-18% Protein

Manufacturer's Standard

Passive Immunizing Agent

Manufactured by:
Grifols Therapeutics Inc.
8368 U.S. 70 Bus. Hwy West
Clayton, North Carolina
27520
U.S.A.

Distributed and Imported by:
Grifols Canada Ltd.
5060 Spectrum Way
Suite 405
Mississauga, Ontario
L4W 5N5

Date of Approval:
July 30, 2012

Submission Control No: 157282

Table of Contents

PART I: HEALTH PROFESSIONAL INFORMATION.....	3
SUMMARY PRODUCT INFORMATION	3
DESCRIPTION.....	3
INDICATIONS AND CLINICAL USE.....	3
CONTRAINDICATIONS	5
WARNINGS AND PRECAUTIONS.....	5
ADVERSE REACTIONS.....	6
DRUG INTERACTIONS	7
DOSAGE AND ADMINISTRATION	7
OVERDOSAGE	9
ACTION AND CLINICAL PHARMACOLOGY	9
STORAGE AND STABILITY.....	10
DOSAGE FORMS, COMPOSITION AND PACKAGING	10
PART II: SCIENTIFIC INFORMATION	11
PHARMACEUTICAL INFORMATION.....	11
CLINICAL TRIALS	11
DETAILED PHARMACOLOGY	11
TOXICOLOGY	12
REFERENCES	13
PART III: CONSUMER INFORMATION.....	14

GamaSTAN® S/D

Immune Globulin (Human)

Solvent/Detergent Treated

PART I: HEALTH PROFESSIONAL INFORMATION

SUMMARY PRODUCT INFORMATION

Table 1 – Product Information Summary

Route of Administration	Dosage Form, Strength	Clinically Relevant Nonmedicinal Ingredients
intramuscular injection	injectable solution, 15-18% protein	<i>For a complete listing see DOSAGE FORMS, COMPOSITION AND PACKAGING section.</i>

DESCRIPTION

GamaSTAN® S/D treated with solvent/detergent is a sterile solution of immune globulin for intramuscular administration; it contains no preservative. GamaSTAN® S/D is prepared by cold ethanol fractionation from human plasma. The immune globulin is isolated from solubilized Cohn fraction II. The fraction II solution is adjusted to a final concentration of 0.3% tri-n-butyl phosphate (TNBP) and 0.2% sodium cholate. After the addition of solvent (TNBP) and detergent (sodium cholate), the solution is heated to 30°C and maintained at that temperature for not less than 6 hours. After the viral inactivation step, the reactants are removed by precipitation, filtration and finally ultrafiltration and diafiltration. GamaSTAN® S/D is formulated as a 15-18% protein solution at a pH of 6.4-7.2 in 0.21-0.32 M glycine. The pH is adjusted with sodium carbonate. GamaSTAN® S/D is then incubated in the final container for 21-28 days at 20-27°C.

INDICATIONS AND CLINICAL USE

Passive immunization should be considered when vaccines for active immunization are not available, or in situations when vaccine has not been used prior to exposure to the infective agent or is contraindicated (1). GamaSTAN® S/D is indicated in the following situations.

Hepatitis A

The prophylactic value of GamaSTAN® S/D is greatest when given before or soon after exposure to hepatitis A. GamaSTAN® S/D is not indicated in persons with clinical manifestations of hepatitis A or in those exposed more than 2 weeks previously.

Measles (Rubeola)

GamaSTAN® S/D should be given to prevent or modify measles in susceptible person exposed fewer than 6 days previously (2). A susceptible person is one who has not been vaccinated and has not had measles previously. GamaSTAN® S/D may be especially indicated for susceptible household contacts of measles patients, particularly contacts under 1 year of age, for whom the risk of complications is highest (2). GamaSTAN® S/D and measles vaccine should not be given at the same time (2). If a child is older than 12 months and has received GamaSTAN® S/D, he should be given measles vaccine about 5 months later when the measles antibody titer will have disappeared, provided there are no contraindications to the vaccine (1).

If a susceptible child exposed to measles is immunocompromised, GamaSTAN® S/D should be given immediately (3). GamaSTAN® S/D may also be considered for severely immunocompromised individuals exposed to measles regardless of immunization status. Children who are immunocompromised should not receive measles vaccine or any other live viral vaccine (4).

Varicella

Passive immunization against varicella in immunosuppressed patients is best accomplished by use of Varicella-Zoster Immune Globulin (Human) [VZIG]. If VZIG is unavailable, GamaSTAN® S/D, promptly given, may also modify varicella (5).

Rubella

The routine use of GamaSTAN® S/D for prophylaxis of rubella in early pregnancy is of dubious value and cannot be justified. Some studies suggest that the use of GamaSTAN® S/D in exposed, susceptible women can lessen the likelihood of infection and fetal damage; therefore, GamaSTAN® S/D may benefit those women who will not consider a therapeutic abortion (3).

CONTRAINDICATIONS

- GamaSTAN® S/D should not be given to patients who are hypersensitive to this drug or to any ingredient in the formulation or component of the container. For a complete listing, see the [DOSAGE FORMS, COMPOSITION AND PACKAGING](#) section.
- GamaSTAN® S/D should not be given to persons with isolated immunoglobulin A (IgA) deficiency. Such persons have the potential for developing antibodies to IgA and could have anaphylactic reactions to subsequent administration of blood products that contain IgA (7).
- GamaSTAN® S/D should not be administered to patients who have severe thrombocytopenia or any coagulation disorder that would contraindicate intramuscular injections.

WARNINGS AND PRECAUTIONS

Serious Warnings and Precautions

- For intramuscular injection only. Do not give intravenously or subcutaneously (see [WARNINGS AND PRECAUTIONS: General](#)).
- Products made from human plasma may contain infectious agents such as viruses (see [WARNINGS AND PRECAUTIONS: General](#)).

General

GamaSTAN® S/D should not be administered intravenously or subcutaneously because of the potential for serious reactions. Injections should be made intramuscularly, and care should be taken to draw back on the plunger of the syringe before injection in order to be certain that the needle is not in a blood vessel.

Skin tests should not be done. In most human beings the intradermal injection of concentrated gamma globulin solution with its buffers causes a localized area of inflammation which can be misinterpreted as a positive allergic reaction. In actuality, this does not represent an allergy; rather, it is localized tissue irritation of a chemical nature. Misinterpretation of the results of such tests can lead the physician to withhold badly needed human immunoglobulin from a patient who is not actually allergic to this material. True allergic responses to human gamma globulin given in the prescribed intramuscular manner are rare.

Although systemic reactions to intramuscularly administered immunoglobulin preparations are rare, epinephrine should be available for treatment of acute allergic symptoms.

GamaSTAN® S/D is made from human plasma. Products made from human plasma may contain infectious agents, such as viruses, that can cause disease. The risk that such products will transmit an infectious agent has been reduced by screening plasma donors for prior exposure to certain viruses, by testing for the presence of certain current virus infections, and by inactivating and/or removing certain viruses. Despite these measures, such products can still potentially transmit disease. There is also the possibility that

unknown infectious agents may be present in such products. Individuals who receive infusions of blood or plasma products may develop signs and/or symptoms of some viral infections, particularly hepatitis C. ALL infections thought by a physician possibly to have been transmitted by this product should be reported by the physician or other healthcare provider to Grifols Canada Ltd. [1-866-482-5226].

The physician should discuss the risks and benefits of this product with the patient, before prescribing or administering to the patient.

Special Populations

Pregnant Women

There is no experience of exposure in pregnancy during clinical trials. Animal reproduction studies have not been conducted with GamaSTAN® S/D. It is also not known whether GamaSTAN® S/D can cause fetal harm when administered to a pregnant woman or can affect reproduction capacity. GamaSTAN® S/D should be given to a pregnant woman only if clearly needed.

Nursing Women

Because of the potential for unknown effects from GamaSTAN® S/D in infants being nursed by mothers taking GamaSTAN® S/D, a decision should be made to either discontinue nursing or discontinue the administration of GamaSTAN® S/D, taking into account the importance of GamaSTAN® S/D therapy to the mother and the possible risk to the infant.

Pediatrics (<18 years of age)

The safety and effectiveness of GamaSTAN® S/D in the pediatric population have not been established.

Monitoring and Laboratory Tests

None required.

ADVERSE REACTIONS

Adverse Drug Reaction Overview

Local pain and tenderness at the injection site, urticaria, and angioedema may occur. Anaphylactic reactions, although rare, have been reported following the injection of human immune globulin preparations. Anaphylaxis is more likely to occur if GamaSTAN® S/D is given intravenously; therefore, GamaSTAN® S/D must be administered only intramuscularly.

Table 2 –Adverse Drug Reactions Associated with Immune Globulin (Human)

General disorders and administration site conditions	Local pain and injection site tenderness
Immune system disorders	Angioedema
	Anaphylaxis
	Urticaria

DRUG INTERACTIONS

Drug-Drug Interactions

Table 3 – Established or Potential Drug-drug Interactions

Proper Name	Ref	Effect	Clinical Comment
Live viral vaccines	T	Antibodies in the globulin preparation may interfere with the response to live viral vaccines such as measles, mumps, polio and rubella (1).	Use of such vaccines should be deferred until approximately 5 months after GamaSTAN® S/D administration (1).

Legend: C=Case Study; CT=Clinical Trial; T=Theoretical

Drug-Food Interactions

No interactions are known.

Drug-Herb Interactions

No interactions are known.

Drug-Laboratory Interactions

No interactions are known.

DOSAGE AND ADMINISTRATION

Dosing Considerations

For intramuscular injection only. Do not give intravenously or subcutaneously.

Recommended Dose and Dosage Adjustment

Hepatitis A

GamaSTAN® S/D in a dose of 0.02 mL/kg is recommended for household and institutional hepatitis A case contacts.

The following doses of GamaSTAN® S/D are recommended for persons who plan to travel in areas where hepatitis A is common (8).

<u>Length of Stay</u>	<u>Dose Volume</u>
Less than 3 months	0.02 mL/kg
3 months or longer	0.06 mL/kg (repeat every 4-6 months)

Measles (Rubeola)

GamaSTAN® S/D should be given in a dose of 0.25 mL/kg to prevent or modify measles in a susceptible person exposed fewer than 6 days previously (1,2). A susceptible child who is exposed to measles and who is immunocompromised should receive a dose of 0.5 mL/kg (maximum dose, 15 mL) of GamaSTAN® S/D immediately (3). The dosage of Immune Globulin (Human) for exposed individuals who have underlying malignant disease should be 0.5 mL/kg or 15 mL maximum (1).

Varicella

If Varicella-Zoster Immune Globulin (Human) is unavailable, GamaSTAN® S/D at a dose of 0.6 to 1.2 mL/kg, promptly given, may also modify varicella (5).

Rubella

Some studies suggest that the use of GamaSTAN® S/D in exposed, susceptible women can lessen the likelihood of infection and fetal damage; therefore, GamaSTAN® S/D at a dose of 0.55 mL/kg may benefit those women who will not consider a therapeutic abortion (3).

Administration

GamaSTAN® S/D is administered intramuscularly (see [WARNINGS AND PRECAUTIONS: General](#)), preferably in the anterolateral aspects of the upper thigh and the deltoid muscle of the upper arm. The gluteal region should not be used routinely as an injection site because of the risk of injury to the sciatic nerve. Doses over 10 mL should be divided and injected into several muscle sites to reduce local pain and discomfort. An individual decision as to which muscle is injected must be made for each patient based on the volume of material to be administered. If the gluteal region is used when very large volumes are to be injected or multiple doses are necessary, the central region **MUST** be avoided; only the upper, outer quadrant should be used (9).

Parenteral drug products should be inspected visually for particulate matter and discoloration prior to administration, whenever solution and container permit.

A number of factors beyond our control could reduce the efficacy of this product or even result in an ill effect following its use. These include improper storage and handling of the product after it leaves our hands, diagnosis, dosage, method of administration, and biological differences in individual patients. Because of these factors, it is important that this product be stored properly and that the directions be followed carefully during use

Reconstitution

Not required.

OVERDOSAGE

Although no data are available, clinical experience with other immunoglobulin preparations suggests that the only manifestations would be pain and tenderness at the injection site.

ACTION AND CLINICAL PHARMACOLOGY

Mechanism of Action

Passive immunization with GamaSTAN® S/D modifies hepatitis A, and prevents or modifies measles. GamaSTAN® S/D is not standardized with respect to antibody titers against hepatitis B surface antigen (HBsAg) and should not be used for prophylaxis of viral hepatitis type B. Prophylactic treatment to prevent hepatitis B can best be accomplished with use of Hepatitis B Immune Globulin (Human), often in combination with Hepatitis B Vaccine (8). GamaSTAN® S/D is unlikely to be of benefit for post-exposure management of hepatitis C (1).

GamaSTAN® S/D may be of benefit in women who have been exposed to rubella in the first trimester of pregnancy and who will not consider a therapeutic abortion (3). GamaSTAN® S/D may also be considered for use in immunocompromised patients for passive immunization against varicella if Varicella-Zoster Immune Globulin (Human) is not available (5).

GamaSTAN® S/D is not indicated for routine prophylaxis or treatment of rubella, poliomyelitis, mumps, or varicella. It is not indicated for allergy or asthma in patients who have normal levels of immunoglobulin (3).

Pharmacodynamics

See Mechanism of Action.

Pharmacokinetics

In a clinical study in healthy human adults receiving another hyperimmune immune globulin product treated with solvent/detergent, Rabies Immune Globulin (Human), prepared by the same manufacturing process, detectable passive antibody titers were observed in the serum of all subjects by 24 hours post injection and persisted through the 21 day study period. These results suggest that passive immunization with immune globulin products is not affected by the solvent/detergent treatment.

Duration of Effect

Peak levels of immunoglobulin G are obtained approximately 2 days after intramuscular injection of GamaSTAN® S/D (10). The half-life of IgG in the circulation of individuals with normal IgG levels is 23 days (11).

STORAGE AND STABILITY

Store at 2-8°C. Do not freeze. Do not use after expiration date. The vials are single use. Once entered, discard any unused contents.

DOSAGE FORMS, COMPOSITION AND PACKAGING

GamaSTAN® S/D contains 15-18% immune globulin (human) as active ingredient. It also contains 0.21-0.32 M glycine, USP.

GamaSTAN® S/D is supplied in 2 mL, 5 mL and 10 mL single use vials.

PART II: SCIENTIFIC INFORMATION

PHARMACEUTICAL INFORMATION

Drug Substance

Proper name: GamaSTAN® S/D
Chemical name: Immune Globulin (Human)

Product Characteristics

GamaSTAN® S/D is formulated as a 15-18% protein solution at a pH of 6.4-7.2 in 0.21-0.32 M glycine. It contains no preservative.

Viral Inactivation

The removal and inactivation of spiked model enveloped and non-enveloped viruses during the manufacturing process for GamaSTAN® S/D has been validated in laboratory studies. Human Immunodeficiency Virus, Type 1 (HIV-1), was chosen as the relevant virus for blood products; Bovine Viral Diarrhea Virus (BVDV) was chosen to model Hepatitis C virus; Pseudorabies virus (PRV) was chosen to model Hepatitis B virus and the Herpes viruses; and Reo virus type 3 (Reo) was chosen to model non-enveloped viruses and for its resistance to physical and chemical inactivation. Significant removal of model enveloped and non-enveloped viruses is seen in the Fraction II+IIIW to Effluent III step and significant removal of PRV and Reo virus is seen in the Effluent III to Filtrate III step. Significant inactivation of enveloped viruses is achieved at the time of treatment of solubilized Cohn Fraction II with solvent/detergent.

CLINICAL TRIALS

Though formal safety and efficacy trials have not been conducted with GamaSTAN® S/D, the clinical effectiveness of Immune Globulin (Human) in a number of clinical situations is well established. Please refer to the most recent edition of the Canadian Immunization Guide for information regarding efficacy and safety in various indications.

DETAILED PHARMACOLOGY

Animal Pharmacology

The effect of solvent-detergent treatment on the pharmacokinetic properties of Immune Globulin (Human) was studied in rabbits and rhesus monkeys. No significant differences were observed between products with or without solvent-detergent treatment with respect to time to maximal

plasma concentration (t_{\max}), maximum plasma concentration (C_{\max}), half-life ($t_{1/2}$) and area under the plasma concentration curve (AUC).

Human Pharmacology

See Product Monograph PART I: [ACTION AND CLINICAL PHARMACOLOGY](#).

TOXICOLOGY

Acute Toxicity

Acute and subacute toxicity of solvent-detergent Immune Globulin (Human) was assessed in rats and rabbits. The intramuscular LD_{50} of the solvent-detergent treated product for rats and rabbits was > 2.4 mL (396 mg/kg). These values indicate a large margin of safety when compared to the clinical dose of 0.133 mL (21.9 mg)/kg.

Repeated Dose Toxicity

Repeated administration to rats and rabbits at dosages approximately nine-fold greater than those administered in the clinic did not produce any clinically relevant toxicity.

Reproductive Toxicology

Animal reproduction studies have not been conducted with GamaSTAN® S/D.

REFERENCES

1. NACI. Canadian Immunization Guide, 6th ed. Ottawa: National Advisory Committee on Immunization. 2002.
2. CDC. Measles, mumps, and rubella - vaccine use and strategies for elimination of measles, rubella, and congenital rubella syndrome and control of mumps: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 1998;47(RR-8):1-58.
3. AAP. Passive immunization. In: Pickering LK, editor. *Red Book: 2003 Report of the Committee on Infectious Diseases*. 26th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2003. pp. 53-66.
4. Bruton OC. Agammaglobulinemia. *Pediatrics* 1952;9(6):722-8.
5. Gershon AA, Piomelli S, Karpatkin M, Smithwick E, Steinberg S. Antibody to varicella-zoster virus after passive immunization against chickenpox. *J Clin Microbiol* 1978;8(6):733-5.
6. CDC. Use of vaccines and immune globulins in persons with altered immunocompetence: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 1993;42(RR-4):1-18.
7. Fudenberg HH. Sensitization to immunoglobulins and hazards of gamma globulin therapy. In: Merler E, editor. *Immunoglobulins: biological aspects and clinical uses*. Washington, DC: Nat Acad Sci; 1970. pp. 211-20.
8. CDC. Protection against viral hepatitis: recommendations of the Immunization Practices Advisory Committee (ACIP). *MMWR* 1990;39(RR-2):1-26.
9. CDC. General recommendations on immunization: recommendations of the Advisory Committee on Immunization Practices (ACIP) and the American Academy of Family Physician (AAFP). *MMWR* 2002;51(RR-2):1-36.
10. Smith GN, Griffiths B, Mollison D, Mollison PL. Uptake of IgG after intramuscular and subcutaneous injection. *Lancet* 1972;1(7762):1208-12.
11. Waldman TA, Strober W, Blaese RM. Variations in the metabolism of immunoglobulins measured by turnover rates. *Immunoglobulins: biological aspects and clinical uses* 1970:33-51.

PART III: CONSUMER INFORMATION

GamaSTAN® S/D

Immune Globulin (Human)

Solvent/Detergent Treated

This leaflet is Part 3 of a three-part "Product Monograph" published when GamaSTAN® S/D was approved for sale in Canada and is designed specifically for Consumers. This leaflet is a summary and will not tell you everything about GamaSTAN® S/D. Contact your doctor or pharmacist if you have any questions about the drug.

ABOUT THIS MEDICATION

What the medication is used for:

GamaSTAN® S/D may be used if you have not had a vaccine for hepatitis A, measles, chickenpox, rubella, or other infections and have been around people who have been sick with these illnesses.

What it does:

GamaSTAN® S/D provides antibodies to help prevent or lessen the severity of hepatitis A, measles, chickenpox, rubella, or other infections.

When it should not be used:

You should not use this medicine if your body does not make enough immunoglobulin A (IgA), which could cause you to have an allergic reaction to blood products that contain IgA.

You should not be given GamaSTAN® S/D if you have any bleeding disorder that would make it unsafe for you to be given an injection into the muscles.

What the medicinal ingredient is:

The medicinal ingredient of GamaSTAN® S/D is 15-18% human immune globulin protein.

What the nonmedicinal ingredients are:

GamaSTAN® S/D also contains the amino acid glycine (at a concentration of 0.21-0.32 M), which acts as a stabilizer.

What dosage forms it comes in:

GamaSTAN® S/D comes in 2 mL, 5 mL and 10 mL vials.

WARNINGS AND PRECAUTIONS

Serious Warnings and Precautions

- GamaSTAN® S/D must be injected into muscles only. It should not be injected directly into blood vessels (intravenously) or under the skin (subcutaneously).
- Products made from human plasma may contain infectious agents such as viruses. However, the manufacturing process of GamaSTAN® S/D is designed to inactivate and eliminate possible infectious agents. You should discuss the risks and benefits of this product with your healthcare provider.

BEFORE you use GamaSTAN® S/D talk to your doctor or pharmacist if:

- you are pregnant or breastfeeding
- you have had an allergic reaction to immune globulin or any of the other ingredients in the medicine

INTERACTIONS WITH THIS MEDICATION

GamaSTAN® S/D may interfere with some vaccines. Talk with your healthcare professional if you will receive any type of vaccine within 6 months of GamaSTAN® S/D treatment.

See also ABOUT THIS MEDICATION: When it should not be used, and SIDE EFFECTS AND WHAT TO DO ABOUT THEM.

PROPER USE OF THIS MEDICATION

Usual dose

Your doctor will determine the amount of GamaSTAN® S/D that is right for you and when your shots should be given. An intramuscular or IM injection is a shot given into a muscle, usually in the buttocks. A doctor, nurse or other caregiver trained to give injections will give your treatment.

Overdose

Although there is no information on the effects of GamaSTAN® S/D overdose, experience with similar medicines suggests that the only effect would be pain and tenderness at the needle injection site.

Missed Dose

It is important that you receive GamaSTAN® S/D as instructed by your healthcare professional. If your doctor tells you that more than one treatment is required, you should consult him/her if a treatment appointment is missed.

SIDE EFFECTS AND WHAT TO DO ABOUT THEM

Pain may occur where the injection is given. Talk with your doctor if the pain is severe.

You should talk with your healthcare professional if you experience rash or hives (swelling, redness, intense itching, and burning). or if you develop swelling of the lips, other parts of the parts of the mouth and throat, eyelids, genitals, hands or feet

Allergic reactions, although rare, have been reported following the injection of human immune globulin. Talk with your doctor immediately if you experience any of these side effects:

- wheezing or trouble breathing
- chest tightness
- severe abdominal cramps
- severe vomiting
- severe diarrhea

This is not a complete list of side effects. For any unexpected effects while taking GamaSTAN® S/D, contact your doctor or pharmacist.

HOW TO STORE IT

GamaSTAN® S/D should be stored at 2-8°C. It should not be frozen or used past the expiration date.

REPORTING SUSPECTED SIDE EFFECTS

To monitor drug safety, Health Canada collects information on serious and unexpected effects of drugs. If you suspect you have had a serious or unexpected reaction to this drug you may notify Health Canada by:

toll-free telephone: 866-234-2345

toll-free fax: 866-678-6789

By email: cadtmp@hc-sc.gc.ca

By regular mail: National AR Centre
Marketed Health Products
Safety and Effectiveness
Information Division
Marketed Health Products Directorate
Tunney's Pasture, AL 0701C
Ottawa ON
K1A 0K9

NOTE: Before contacting Health Canada, you should contact your physician or pharmacist.

MORE INFORMATION

This document, plus the full product monograph prepared for health professionals, can be obtained by contacting Grifols Canada Ltd., at 1-866-482-5226. This leaflet was prepared by:

Grifols Therapeutics Inc. (Manufacturer)
8368 US 70 Bus. Hwy West
Clayton, NC 27520

Grifols Canada Ltd. (Importer and Distributor)
5060 Spectrum Way, Suite 405
Mississauga, Ontario
L4W 5N5

Last revised: July 30, 2012