

POLICY: Immune Globulin Subcutaneous (SCIG)

- Cutaquig® (immune globulin subcutaneous [human] 16.5% solution Octapharma USA, Inc.)
- Cuvitru[™] (immune globulin subcutaneous 20% solution Baxalta US Inc)
- Gammagard Liquid (immune globulin infusion 10% solution Baxalta US Inc.)
- Gammaked[™] (immune globulin injection 10% caprylate/chromatography purified Kedrion Biopharma, Inc. [manufactured by Grifols Therapeutics Inc])
- Gamunex®-C (immune globulin injection 10% caprylate/chromatography purified Grifols [manufactured by Grifols Therapeutics, Inc])
- Hizentra® (immune globulin subcutaneous 20% liquid CSL Behring)
- HyQvia (immune globulin infusion 10% with recombinant human hyaluronidase Baxalta US Inc.)
- Xembify® (immune globulin subcutaneous [human] 20% solution Grifols Therapeutics LLC)

APPROVAL DATE: 07/31/2019

OVERVIEW

Immune globulin subcutaneous (SCIG) products are concentrated human immunoglobulins, primarily immunoglobulin G (IgG), that are prepared from pooled plasma collected from a large number of human donors. 1-5,7,12,13 SCIG supplies a broad spectrum of opsonizing and neutralizing IgG antibodies against a wide variety of bacterial and viral agents. The exact mechanism of SCIG in primary immune deficiency is not fully understood. SCIG products are indicated for replacement therapy in patients with primary humoral immune deficiency (PID), including, but is not limited to the humoral defect in the following conditions: common variable immunodeficiency (CVID), X-linked agammaglobulinemia (XLA) [congenital agammaglobulinemia], Wiskott-Aldrich syndrome, and severe combined immunodeficiencies (SCID). 1-5,7,12,13 SCIG is also indicated for measles prophylaxis in individuals with PID who have been exposed to measles or who are at high risk of measles exposure. 4,6,13,29 Hizentra has an additional indication of chronic inflammatory demyelinating polyneuropathy (CIDP) via subcutaneous (SC) administration. HyQvia limitation of use: safety and efficacy of chronic use of recombinant human hyaluronidase (rHu hyaluronidase) in HyQvia have not been established in conditions other than PID. 5 Safety of HyQvia has not been established in children.

Hizentra, Cuvitru, Xembify, and Cutaquig are indicated as a SC infusion only, using an infusion pump. A7,12,13 Gammagard Liquid, Gammaked, and Gamunex-C may be administered as a SC infusion or an intravenous (IV) infusion for PID. HyQvia is indicated for SC infusion only, with sequential infusion of the rHu hyaluronidase first and followed 10 minutes later with the immune globulin (IG) infusion using an infusion pump. The IG infusion provides the therapeutic effect of HyQvia. The rHu hyaluronidase acts locally to increase dispersion and absorption of the IG. When administered as an IV infusion, Gamunex-C and Gammaked are also indicated for idiopathic thrombocytopenia purpura (ITP) and chronic inflammatory demyelinating polyneuropathy (CIDP). Gammagard Liquid when given as an IV infusion is indicated for maintenance therapy in adults with multifocal motor neuropathy (MMN).

Gammagard Liquid, Gammaked, or Gamunex-C are self-administered once weekly or every 2 weeks by SC infusion. Hizentra, Cuvitru, or Xembify can be administered weekly or at more frequent intervals. Utaquig's dosing interval can be from daily up to weekly. HyQvia is self-administered every 3 to 4 weeks after an initial dose ramp-up. The dose is infused into 1 or 2 injection sites. The volume per site with HyQvia is up to 600 mL in patients who weigh \geq 40 kg and up to 300 mL in patients who weigh \leq 40 kg. The volume per injection site and flow rate is limited with any of the SCIG products and is adjusted individually. Generally, a more stable kinetic profile is noted with SCIG compared with the high peaks and low troughs noted with intravenous immune globulin (IVIG) therapy. Compared to IVIG, SCIG trough (pre-dose) levels are higher and peak serum levels are lower.

EFFICACY

Primary Humoral Immune Deficiency (PID)

Cuvitru, Gammagard Liquid, Gammaked, Gamunex-C, Hizentra, and Xembify are indicated in children aged ≥ 2 years and adults when given by SC infusion. ^{1-4,7,12} HyQvia and Cutaquig are indicated in adults. ^{5,13} HyQvia prescribing information notes that safety has not been established in children. Safety and efficacy of the SCIG products was established in patients with PID who were previously treated with monthly doses of IVIG^{1-5,8-11} or HyQvia. ¹² One week after the last dose of IVIG or HyQvia, patients were started on therapy with a SCIG product given weekly. Various methods were used for estimating the dose of SCIG and adjusting the dose to provide an adequate clinical response. Cuvitru is indicated in patients who are switching from IVIG, HyQvia, or another SCIG product. ¹² Hizentra, Cutaquig, and Xembify are indicated in patients who are switching from another SCIG product or from IVIG therapy. ^{4,7,13} HyQvia is indicated in patients who are naïve to IG therapy or who are switching from another SCIG product or from IVIG therapy. ⁵ An initial treatment interval and dosage ramp-up schedule is outlined in the prescribing information for initiating therapy with HyQvia. The first dose of HyQvia is given about 1 week after the last infusion of the patient's previous IG treatment and is increased to an every 3- or 4-week dose. Initiating treatment with a full monthly dose was not evaluated in the pivotal clinical trial.

Other information indicates SCIG can be started in patients with PID who have not previously been treated with any IG replacement.^{5,14}

Chronic Inflammatory Demyelinating Polyneruopathy (CIDP)

In addition to PID, Hizentra is also indicated for maintenance therapy in adults with CIDP. Two doses of SC immunoglobulin were studied (0.2 g/kg and 0.4 g/kg) were studied and both were efficacious and well-tolerated.²³ SC therapy should be initiated 1 week after the patient's last IVIG infusion. If symptoms worsen while on SC therapy, consideration should be given to transitioning back to an IVIG infusion.⁴

Other Uses

In contrast to IVIG, there are limited data available for off-label uses with SCIG. It is unclear if SC infusions will be effective for disorders that presumably benefit from immunomodulatory effects of peak serum IgG concentrations that result after IV infusion of high doses of IVIG for autoimmune or inflammatory diseases (see *Guidelines*). There is some data, including case reports and small randomized trials, which show SCIG has been effective in diagnoses which overlap with IVIG-studied indications, such as MMN, 18-20 multiple myeloma, 21 or refractory myasthenia gravis. 22

GUIDELINES

According to the Practice Parameter for the Diagnosis and Management of Primary Immunodeficiency which was sponsored and developed by three national allergy and immunology societies (the American Academy of Allergy, Asthma, and Immunology [ACAAI], the American College of Allergy, Asthma and Immunology [ACAAI], and the Joint Council of Allergy, Asthma and Immunology [JCAAI]), IG may be given IV or SC.²⁴ The choice between IV and SC administration may be influenced by: problems with IV access, systemic adverse effects with IV administration, trough IgG levels, site of care (home or infusion center), and physician or patient preference.²⁵ A consensus document providing a definition of CVID was published in 2016.²⁶ The American Academy of Allergy, Asthma & Immunology (AAAAI), the European Academy of Allergy and Clinical Immunology, the World Allergy Organization, and the American College of Allergy, Asthma & Immunology (ACAAI) on common variable immunodeficiency developed this document. CVID is a group of heterogeneous primary antibody failure syndromes that are characterized by hypogamma-globulinemia.

The American Academy of Neurology (AAN) and the American Association of Neuromuscular and Electrodiagnostic Medicine (AANEM) have guidelines and consensus statements regarding the use of intravenous immunoglobulins, but have not yet addressed subcutaneous immune globulin use. 16-17

POLICY STATEMENT

This policy involves the use of SCIG products. Prior authorization is recommended for medical benefit coverage of IG products (Cutaquig, Cuvitru, Gammagard liquid, Gammaked, Gamunex-C, Hizentra, HyQvia, Xembify). Coverage is recommended for those who meet the Criteria and Dosing for the listed indication(s). Requests for doses outside of the established dosing documented in this policy will be considered on a case-by-case basis by a clinician (i.e., Medical Director or Pharmacist). All approvals are provided for the duration noted below. In cases where the approval is authorized in months, 1 month is equal to 30 days. Extended approvals are allowed if the patient continues to meet the criteria and dosing.

Because of the of the specialized skills required for evaluation and diagnosis of patients treated with SCIG as well as the monitoring required for adverse events and long-term efficacy, select approvals require SCIG to be prescribed by or in consultation with a physician who specializes in the condition being treated.

RECOMMENDED AUTHORIZATION CRITERIA

I. Coverage of Cutaquig, Cuvitru, Gammagard Liquid, Gammaked, Gamunex-C, Hizentra, and Xembify (all listed products except HyQvia) is recommended in those who meet the following criteria:

FDA-Approved Indications

1. Primary Immunodeficiencies (PID).

Criteria. Approve for the duration noted if the patient meets ONE of the following criteria (A <u>or</u> B):

- **A)** <u>Initial Therapy</u>: Approve for 1 year if the patient meets BOTH of the following criteria (i <u>and</u> ii):
 - i. SCIG is prescribed by or in consultation with an allergist/immunologist, immunologist, otolaryngologist (ear nose and throat [ENT] physician), pulmonologist, or an infectious diseases physician who treats patients with primary immune deficiencies; AND
 - ii. The patient meets ONE of the following (a, b, or c):

<u>NOTE:</u> An exception can be made for the impaired antibody response if, according to the prescriber, the delay caused by pre-vaccination and post-vaccination antibody measurement would be deleterious to the patient's health.

- a) The patient has a diagnosis of congenital agammaglobulinemia, X-linked agammaglobulinemia, other agammaglobulinemia due to the absence of B-cells, Wiskott-Aldrich syndrome, ataxia telangiectasia, DiGeorge syndrome, severe combined immunodeficiency (SCID), Hyper-Immunoglobulin M (IgM) syndromes, an IgG level lower than 250 mg/dL, or a primary immune deficiency which has been confirmed by genetic or molecular testing; OR
- **b)** The patient has a diagnosis of common variable immunodeficiency (CVID), unspecified hypogammaglobulinemia, or other immunodeficiencies with significant hypogammaglobulinemia and meets the following (1 and either 2 or 3):
 - (1) The patient's pretreatment IgG level is below the normal range (age-adjusted and according to the normal reference range for the reporting laboratory); AND
 - (2) The patient has an impaired antibody response (i.e., failure to produce antibodies to specific antigens); OR
 - (3) The patient has recurrent infections; OR
- c) The patient has an IgG subclass deficiency or a diagnosis of selective antibody deficiency (SAD) and meets the following (1 and 2):
 - (1) The patient has an impaired antibody response (i.e., failure to produce antibodies to specific antigens); AND
 - (2) The patient has recurrent infections.
- **B**) Patients Currently Receiving SCIG (Cutaquig, Cuvitru, Gammagard Liquid, Gammaked, Gamunex-C, Hizentra, and Xembify): Approve for 1 year if the patient has been diagnosed with a primary immunodeficiency and is continuing to receive benefit from the product (e.g., increased IgG levels, preventing or controlling infections).

Dosing in Primary Immune Deficiency in Adults, Children or Adolescents. Approve the following dosing regimens (A, B, C, D, OR E) for Cuvitru, Gammagard Liquid, Gammaked, Gamunex-C, Hizentra, Cutaquig, or Xembify):

- **A)** The patient is transitioning from IVIG, and the maintenance dose (given once weekly, every 2 weeks, or more frequently than once weekly [e.g., 2 to 7 times per week]) is based on the patient's previous monthly IVIG dose;¹⁻⁴ OR
- **B**) The patient is transitioning from another SCIG product, and the maintenance dose (given once weekly, every 2 weeks, or more frequently than once weekly) is based on the patient's previous weekly SCIG dose;^{4,12} OR
- C) The patient is initiating SCIG therapy without previous IVIG or SCIG therapy and is receiving a loading dose (e.g., 100 mg per kg once daily for 5 consecutive days) followed by once weekly (or more frequently as necessitated by volume) maintenance dosing; OR
- **D**) The dose and interval between doses has been adjusted based on clinical response (e.g., frequency or severity of infections, hospitalization, days of school or work missed, failure to thrive, or to treat/prevent complications such as chronic lung disease, granulomatous infiltrative disease, or autoimmune disease) as determined by the prescribing physician; OR
- **E)** Patients with primary immune deficiency and <u>exposure to measles (rubeola)</u> must meet ONE of the following (i or ii):^{4,12}
 - i. In patients receiving <u>weekly or more frequent SCIG</u>, the <u>total</u> weekly dose should be a minimum of 200 mg per kg for two consecutive weeks AND if the patient has already been exposed to measles, the minimum dose should be given as soon as possible after exposure; OR

ii. In patients receiving SCIG every 2 weeks, one dose of a minimum of 400 mg per kg should be given, AND if the patient has already been exposed to measles, the minimum dose should be given as soon as possible after exposure.

SCIG therapy may be used in patients previously treated with IVIG; patients who are switching from one SCIG product to another; or who have not previously been treated with IG therapy. As a guide, in patients transitioning from IVIG to SCIG, SCIG is generally started 1 week after the patient's last regularly scheduled IVIG infusion. In patients receiving IVIG, the initial SCIG dose is based on the patient's monthly IVIG dose or with HyQvia, is based on a ramp-up schedule provided in the prescribing information. In patients switching from one SCIG product to another, the dose is based on the previous weekly SCIG dose. Subsequent dose adjustment is made by the prescribing physician and is based on clinical response. For SCIG products other than HyQvia, as a guide, in patients previously untreated with IG therapy, a loading dose period (e.g., 5 consecutive days) may be used followed by subsequent weekly (or more frequent) maintenance dose as determined by the prescribing physician. Further dose adjustment is determined by the prescribing physician and based on clinical response.

2. Chronic Inflammatory Demyelinating Polyneurapthy or Polyradiculoneurpathy (CIDP).

Criteria. Approve for 1 year if the patient meets ONE of the following criteria (A or B):

- **A)** <u>Initial therapy (with SCIG)</u>: Approve if the patient meets BOTH of the following criteria (i, ii, and iii):
 - i. The patient is greater than or equal to 18 years of age; AND
 - ii. The medication has been prescribed by or in consultation with a neurologist; AND
 - iii. Electrodiagnostic studies support the diagnosis of CIDP.
- B) Patients Currently Receiving SCIG (Cutaquig, Cuvitru, Gammagard Liquid, Gammaked, Gamunex-C, Hizentra, and Xembify): Approve if the patient has a clinically significant improvement in neurological symptoms (for example, improvement in disability; nerve conduction study results improved or stabilized; physical examination show improvement in neurological symptoms, strength, and sensation) as determined by the prescriber (a neurologist or in consultation with a neurologist).

Dosing in Chronic Inflammatory Demyelinating Polyneuropathy (CIDP). Approve the following dosing regimens (A or B):

- **A)** The dose is either 0.2 g/kg or 0.4 g/kg per week administered in 1 or 2 sessions over 1 or 2 consecutive days; 4 OR
- **B**) The dose has been titrated according to clinical response (Review on a case-by-case basis).
- **II.** Coverage of HyOvia is recommended in those who meet the following criteria:

FDA-Approved Indications

1. Primary Immunodeficiencies (PID).

Criteria. Approve for the duration noted if the patient meets ONE of the following criteria (A or B):

- **A)** <u>Initial Therapy</u>: Approve for 1 year if the patient meets ALL of the following criteria (i, ii, and iii):
 - i. SCIG is prescribed by or in consultation with an allergist/immunologist, immunologist, otolaryngologist (ear nose and throat [ENT] physician),

- pulmonologist, or an infectious diseases physician who treats patients with primary immune deficiencies; AND
- ii. The patient is ≥ 18 years of age; AND
- **iii.** The patient meets ONE of the following (a, b, or c):
 - <u>NOTE:</u> An exception can be made for the impaired antibody response if, according to the prescriber, the delay caused by pre-vaccination and post-vaccination antibody measurement would be deleterious to the patient's health.
 - a) The patient has a diagnosis of congenital agammaglobulinemia, X-linked agammaglobulinemia, other agammaglobulinemia due to the absence of B-cells, Wiskott-Aldrich syndrome, ataxia telangiectasia, DiGeorge syndrome, severe combined immunodeficiency (SCID), Hyper-Immunoglobulin M (IgM) syndromes, an IgG level lower than 250 mg/dL, or a primary immune deficiency which has been confirmed by genetic or molecular testing; OR
 - **b)** The patient has a diagnosis of common variable immunodeficiency (CVID), unspecified hypogammaglobulinemia, or other immunodeficiencies with significant hypogammaglobulinemia and meets the following (1 and either 2 or 3):
 - (1) The patient's pretreatment IgG level is below the normal range (age-adjusted and according to the normal reference range for the reporting laboratory); AND
 - (2) The patient has an impaired antibody response (i.e., failure to produce antibodies to specific antigens); OR
 - (3) The patient has recurrent infections; OR
 - c) The patient has an IgG subclass deficiency or a diagnosis of selective antibody deficiency (SAD) and meets the following (1 and 2):
 - (1) The patient has an impaired antibody response (i.e., failure to produce antibodies to specific antigens); AND
 - (2) The patient has recurrent infections.
- **B**) Patients Currently Receiving SCIG (HyQvia): Approve for 1 year if the patient has been diagnosed with a primary immunodeficiency and is continuing to receive benefit from the product (e.g., increased IgG levels, preventing or controlling infections).

Safety of HyQvia has not been established in pediatric patients.⁵ Cuvitru, Gammagard Liquid, Gammaked, Gamunex-C, Hizentra, Xembify are indicated for primary humoral immunodeficiency in patients ≥ 2 years of age.^{1-4,7,12} SCIG is used for replacement in primary immunodeficiency disorders where antibody production is absent or deficient to increase IgG levels and most of the time to prevent or control recurrent or unusually severe bacterial infections.^{15,24}

Dosing in Primary Immune Deficiency in Adults. Approve the following dosing regimens $(\underline{A} \ OR \ B)$ for HyQvia:

- **A)** The patient is starting HyQvia and the dose and interval is being ramped-up to determine tolerability; OR
 - Note: The patient may be switching from IVIG OR from another SCIG product OR the patient may be naïve to IG therapy. See prescribing information for ramp-up schedule.
- **B**) The patient has already been started on HyQvia after the initial dose ramp-up and ONE of the following applies (i, ii, or iii):
 - i. The dose is 300 to 600 mg/kg given at 3 to 4 week intervals; OR
 - ii. The dose and frequency is the same as previously used when receiving IVIG; OR

iii. The dose and interval between doses has been adjusted based on clinical response (e.g., frequency or severity of infections, hospitalization, days of school or work missed, failure to thrive, or to treat/prevent complications such as chronic lung disease, granulomatous infiltrative disease, or autoimmune disease) as determined by the prescribing physician.

CONDITIONS NOT RECOMMENDED FOR APPROVAL

SCIG has not been shown to be effective, or there are limited or preliminary data or potential safety concerns that are not supportive of general approval for the following conditions. Rationale for non-coverage for these specific conditions is provided below. (Note: This is not an exhaustive list of Conditions Not Recommended for Approval.)

- 1. Selective Immune Globulin A (IgA) Deficiency as the Sole Immunologic Abnormality. Evidence does not support use of SCIG. 15,24-25 Selective IgA deficiency is defined as a serum IgA level less than 0.07 g/L, but normal serum IgG and IgM levels in a patient greater than 4 years of age in whom other causes of hypogammaglobulinemia have been excluded. Selective IgA deficiency may co-exist in some patients with poor specific IgG antibody production, with or without IgG2 subclass deficiency. Some of these patients with a concomitant specific antibody defect might benefit from therapy with SCIG.
- 1. HyQvia in Patients < 18 years of Age. The safety of HyQvia in pediatric patients < 18 years of age has not been established.⁵ HyQvia is indicated in adults. In one prospective, open-label Phase III clinical trial, 83 patients aged 4 to 78 years with primary immunodeficiency received HyQvia.⁵ Eleven of the patients were aged 2 to < 12 years, and 70 patients were aged ≥ 12 years).^{27,28}
- **2.** Coverage is not recommended for circumstances not listed in the Recommended Authorization Criteria. Criteria will be updated as new published data are available.

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HISTORY

Type of Revision	Summary of Changes	Approval Date
Annual revision	 Immunodeficiencies, Primary Humoral, CVID: a) The requirement for a documented history of significant recurrent or persistent, severe bacterial infections and that infections are responding inadequately to treatment with antibiotics and/or appropriate prophylaxis with antibiotics or the patient has multiple antibiotic hypersensitivities were removed. b) The requirement that patient is ≥ 4 years of age was added. c) Previously the criteria required that at least one of three criteria be met. Of these, the option for reduced IgG1 and IgG3 subclass levels or IgG1 alone was deleted. The total IgG level was revised to add that it is below the normal range and measured at least two times more than 3 weeks apart (IgG level is age adjusted and according to the reference lab is still required). Criteria for an antibody response to protein antigen or polysaccharide antigen were revised to add an exception if the physician believes the delay for this testing would be deleterious. Criteria were added requiring that IgA or IgM serum level is lower than the normal range. See policy for details. Immunodeficiencies, Primary Humoral, Unspecified Hypogammaglobulinemia: Similar revisions were made to the criteria as noted in Immunodeficiencies, Primary Humoral CVID above. One difference is that the IgA or IgM levels are in the normal range or higher. 	06/14/2017
Selected revision	• The Policy Statement was revised to add the following: The requirement that the patient meet the criteria for coverage of the requested medication applies to the initial authorization only.	02/07/2018
Selected revision	• Immunodeficiencies, Primary Humoral (Cuvitru, Gammagard Liquid, Gammaked, Gamunex-C, and Hizentra [all listed products except HyQvia]): Age in patients with CVID or Unspecified hypogammaglobulinemia revised to be at least 2 years of age. Previously the age was at least 4 years.	03/14/2018
Annual revision	Added criteria for the diagnosis Chronic Inflammatory Demyelinating Polyneuropathy (CIDP).	07/11/2018
Selected	• The Policy Statement was revised from, the requirement that the patient meet the criteria for coverage of the requested medications applies to the initial authorization only, to the requirement that the patient meet the criteria for coverage of the requested medication applies to patients not currently taking the requested medication. Also added: For patients already on the requested medication, follow the directions under the extended approval section (unless continuation of therapy is addressed in the criteria for coverage).	07/24/2018
Selected revision	 The duration of therapy was updated in the criteria section throughout the policy to align with the PA policy. Updated formatting of the policy by removing extended approval section and placing within the criteria (under patients already started on therapy) to align with the PA policy. Removed duration of therapy and labs/diagnostics section. The policy statement was updated. Cutaquig was added to the policy with the same criteria that applies to the other products with the exception of HyQvia. Immunodeficiency, Primary Humoral (Treatment): For the unspecified hypogammaglobulinemia diagnosis in the criterion that requires that the patient has markedly impaired antibody response to protein testing with a polysaccharide antigen (pneumococcus), the option of "OR according to the prescribing physician that delay caused by pre-vaccination and post-vaccination antibody measurement would be deleterious to the patient's health" was added. 	1/16/2019
Annual revision	 Xembify was added to the policy with the same criteria that applies to the other products with the exception of HyQvia. Immunodeficiency, Primary Humoral (Treatment) was updated to Primary Immunodeficiencies (PID). Criteria for PID was updated to the following: approval if (along with prescribing by a physician specialist) the patient has a diagnosis of congenital agammaglobulinemia, X-linked agammaglobulinemia, other agammaglobulinemia due to the absence of B-cells, Wiskott-Aldrich syndrome, ataxia telangiectasia, DiGeorge syndrome, severe combined immunodeficiency (SCID), Hyper-Immunoglobulin M (IgM) syndrome, an IgG level lower than 250 mg/dL, or a primary immune deficiency which has been confirmed by genetic or molecular testing. For a diagnosis of common variable immunodeficiency (CVID), unspecified hypogammaglobulinemia, or other immunodeficiencies with significant hypogammaglobulinemia, approval if (along with prescribing physician specialist) the patients pretreatment IgG level is below the normal range AND either an impaired antibody response or recurrent infections. For a diagnosis of IgG subclass deficiency or selective antibody deficiency, approval if (along with prescribing physician specialist) the patient has an impaired antibody response and has recurrent infections. 	7/31/2019

• Chronic Inflammatory Demyelinating Polyneuropathy or Polyradiculoneuropathy (CIDP): the criterion, electrodiagnostic studies to support the diagnosis of CIDP, was added. Wording in reference to "determined by the prescribing physician" was changed to "determined by the	
prescriber."	<u> </u>