SUBJECT: Intravenous Immune Globulin (IVIG) & Sub-Cutaneous Immune Globulin (SCIG) Therapy POLICY NUMBER: PHARMACY-26 EFFECTIVE DATE: 11/2005 LAST REVIEW DATE: 05/08/2025			
If the member's subscriber contract excludes coverage for a specific service or prescription drug, it is not covered under that contract. In such cases, medical or drug policy criteria are not applied. This drug policy applies to the following line/s of business:			
Policy Application			
Category:	⊠ Commercial Group (e.g., EPO, HMO, POS, PPO)		
	☑ On Exchange Qualified Health Plans (QHP)	☐ Medicare Part D	
☐ Federal Employee Program (FEP) ☐ Ancillary Services			
	□ Dual Eligible Special Needs Plan (D-SNP)		

DESCRIPTION:

Intravenous immune globulin (IVIG) therapy is used to provide antibodies to patients who are susceptible to diseases for which there is no immunization available. IVIG is a potent immunomodulating agent that consists of concentrated human immunoglobulin, prepared from pooled plasma collected from human donors. Immunologic reactions can be modified, often dramatically by the intravenous administration of a large amount of immune globulin (400 to 2000mg per kilogram of body weight over a period of two to five days). IVIG is also used to treat certain immunodeficiencies. In January 2006, the FDA approved the first immune globulin designed for subcutaneous administration.

This policy only addresses non-specified pooled preparations of intravenous immune globulin, including:

Gammagard S/D (Takeda)

Gammagard Liquid (Takeda)

Gamunex-C (Grifols Therapeutics)

Gammaplex (Bio Products)

Bivigam (ADMA Biologics)

Flebogamma DIF (Instituto Grifols)

Octagam (Octapharma)

Privigen (CSL Behring)

Panzyga (Pfizer)

Asceniv (ADMA Biologics)

Alyglo (GC Biopharma Corp)

As well as non-specified subcutaneous immune globulins:

Cutaquig (Octapharm)

Cuvitru (Takeda)

Hizentra (CSL Behring AG)

HyQvia (Takeda),

Gammaked (Kedrion Biopharma)

Gamunex-C (Grifols Therapeutics)

Gammagard Liquid (Takeda)

Xembify (Grifols Therapeutics)

Intravenous Immune Globulin (IVIG) & Sub-Cutaneous Immune Globulin (SCIG) Therapy

This policy DOES NOT address other immunoglobulin preparations that at are specifically used for passive immunization (such as GamaSTAN) to prevent or attenuate infection with specific viral diseases such as respiratory syncytial virus, cytomegalovirus, or hepatitis A/B, or specifically used to treat infant botulism (such as BabyBig).

IVIG is a polar molecule with a small volume of distribution of 0.042 L/kg, long half-life between 24 and 28 days, and a lack of accumulation in peripheral lipophilic material (48% distributed intravascularly). Due to the properties of the drug, **ideal body weight** will be used for approved dosing calculations. Please see policy guidelines for ideal body weight calculations.

POLICY:

- I. The Health Plan has determined that Asceniv and Alyglo are not medically necessary due to the availability of lower costing options that are likely to produce equal therapeutic results.
 - a. This applies to all lines of business EXCEPT Medicare Part B
- II. Based upon our criteria and review of the peer-reviewed literature IVIG therapy has been medically proven effective and therefore may be considered **medically appropriate** for the following conditions when the appropriate criteria are met.

INDICATIONS CRITERIA Member will be covered for a documented diagnosis (as listed to Primary humoral immunodeficiencies: Agammaglobulinemia (IgG <200 the left) if: 1) There is supporting lab evidence (either a or b): mg/dL or infants with BTK gene or a. Total IgG level <400mg/dl or infants with BTK gene or absence of B lymphocytes) absence of B lymphocytes OR Hypoglobulinemia, b. Normal IgG level and documentation of a lack of ability to Common variable immunodeficiency, produce and antibody response to a protein (e.g., tetanus) Wiskot-Aldrich Syndrome, or polysaccharide antigen** (e.g., Pneumococcal X-Linked immunodeficiency.

- Severe combined immunodeficiency,Selective IgG subclassdeficiency,
- Selective IgO subclassion lie incy
 Selective IgM immunodeficiency
- Immunodeficiency with near/normal IgM (absent IgG, IgA) or known as Hyper IgM Syndrome
- i. **Serum antibody titres to pneumococcus should be measured prior to immunization and 3-6 weeks after immunization with polyvalent pneumococcal polysaccharide vaccine (e.g., Pneumovax); at least 14 polysaccharide antigens should be tested.

polysaccharide or H. Influenza type B.)

- ii. Polysaccharide nonresponsiveness is defined as less than a 4-fold rise in antibody titer and lack of protective antibody titer (specific IgG antibody titer less than 1.3 mcg/ml) in greater than 30 percent of antigens tested (more than 50 percent in children ages 2 to 5 years).
- iii. Further evidence of infection, including sinus and lung imaging, complete blood counts, C-reactive protein measurement, and erythrocyte sedimentation rate determination, may be required to support the need for IVIG supplementation.
- iv. For persons with normal total IgG levels and severe polysaccharide nonresponsiveness, IVIG should be discontinued and the medical necessity of IVIG should be reevaluated 1 year after initiating therapy and every two years thereafter by reassessing immune response to protein and polysaccharide antigens. Immune response should be reevaluated at least 5 months after discontinuation of IVIG. IVIG should also be discontinued

intraverious infinitifie Globalin (1716) & 30	b-outaileous illilliule Globuilli (GOIG) Therapy
	at that time if the number and/or severity of infections have not been reduced, as not all persons with polysaccharide nonresponsiveness benefit from IVIG. AND 2) There is documentation of an infection history meeting one of the following criteria: a. Two or more bacterial infections per year due to persistent and significant reduction in total IgG or IgG subclasses OR b. Unexplained recurrent or persistent severe bacterial infections despite antibiotic therapy OR
	 c. Infections that fail to respond adequately to conservative measures, including prophylactic antibiotics OR d. If total IgG level is <200mg/dl or infants have BTK gene or absence of B lymphocytes, then documentation of an infection history will not be required. AND
	 3) There is documentation of appropriate management of other conditions predisposing to recurrent sinopulmonary infections (e.g., asthma, allergic rhinitis) 4) Initial IVIG dose is 300-600 mg/kg every 4 weeks, titrated to patient response.
Acquired/Secondary Humoral	IVIG will be covered when used to prevent recurrent bacterial
immunodeficiencies with recurrent	infections when:
infection and hypogammaglobinulemia	1) Member must have IgG level less than 600mg/dL; AND
Chronic Lymphocytic Leukemia (CLL),	2) One severe bacterial infection within preceding 6 months, or 2
 Acute Myelogenous Leukemia (AML), 	or more bacterial infections in 1 year.
Chronic Myelogenous Leukemia	3) For CLL, AML, CML – initial IVIG dose is 400 mg/kg every 4
(CML),	weeks.
Hypogammaglobulinemic bone	
marrow transplant patients	
Multiple Myeloma	1) For use in members with "Plateau Phase" of disease (> 3
	months since diagnosis) AND
	2) Member must have IgG< 600mg/dL AND
	3) 2 or more significant infections in last year or a single life-
	threatening infection OR
	4) Member has poor IgG response to the pneumococcal vaccine
T	5) Initial IVIG dose is 200-400 mg/kg every 4 to 6 weeks.
Immune Thrombocytopenia/Idiopathic	1) Must meet one of the following (a or b) with documentation of
Thrombocytopenia Purpura (ITP)	platelet count within previous 30 days: a. Must meet both of the following (i and ii)
(NOTE: For pregnant patients see	i. Must meet <u>one</u> of the following (1 and ii)
"Immune Thrombocytopenia/Idiopathic	1. Platelet count <30 x 10 ⁹ / L OR
Thrombocytopenia Purpura (ITP)—	2. Platelet count <50 x 10 ½ With significant bleeding
Pregnancy" section)	symptoms (e.g., mucous membrane bleeding), high
g,,	bleeding risk (e.g., hypertension, peptic ulcer
	disease, anticoagulant therapy, vigorous lifestyle)
	AND
	ii. Must meet one of the following (1, 2 or 3):
	History of corticosteroid failure (defined as platelet
	count < 30×10^9 /L, or platelet count $\ge 30 \times 10^9$ /L but
	with bleeding symptoms), or contraindication, or
	intolerance to corticosteroids, OR
	 IVIG will be used in combination with corticosteroids OR
	J OK

3. Must have severe thrombocytopenia, defined	28
slatalat 200 v 409/ L agracialar and table at rials	
platelet <20 x 10 ⁹ / L, considered to be at risk	TOF
intracerebral hemorrhage OR b. Platelet count < 100x 10 ⁹ /L and requires increase in	nlatolot
count prior to invasive major surgical procedures (e.g.	
splenectomy)	٠٠,
2) The usual dose for IVIG is 1,000-2,000 mg/kg (can be g	iven as
1,000 mg/kg/day for 2 days, or 400 mg/kg/day for 5 days	
pediatric patients, IVIG may be given as a single dose of	,
1,000mg/kg.	
3) Treatment will be authorized for 6 months at a time and	require
documentation of clinical benefit (e.g., increase in platel	•
from baseline, decrease in bleeding symptoms).	
Immune Thrombocytopenia/Idiopathic 1) Authorization will be granted to pregnant patients with IT	TP for
Thrombocytopenia Purpura (ITP)— the duration of the pregnancy.	
Pregnancy 2) IVIG dose is 1,000 mg/kg/day for 1 to 2 days	
Allogeneic Bone Marrow Transplant 1) Therapy continues for 100 days after transplant.	
2) Requests for treatment 100 days or greater post-transpl	ant
require IgG less than 400mg/dL or CMV, EBV or RSV	
infection.	_
3) IVIG dose is 500mg/kg administered on day 7 and day 2	2
before transplant, and then once weekly.	
4) Note: IVIG is not considered medically necessary in	
autologous bone marrow transplants as these recipients benefit form IVIG treatment.	ao not
Myasthenia Gravis IVIG will be covered when used for Myasthenia Gravis for:	
1) Myasthenic crisis/acute exacerbation:	
a) Must be defined by one or more of the following	
signs/symptoms: dyspnea, severe dysphagia (with w	eak
cough/difficulty clearing secretions), signs of respirate	
muscle weakness (hypophonia, pausing during spee	
take a breath, poor respiratory effort, increased respi	
rate with shallow breaths, use of accessory muscles	
respiration, paradoxical abdominal breathing), intuba	tion, or
mechanical ventilation	
b) Treatment will be authorized on a per episode basis duration of 1 month at a time.	for a
c) Note: For management of myasthenic crises, IVIG is	
administered over 2 to 5 days.	
2) Refractory Myasthenia Gravis:	
a) Must have serious side effects or drug failure with	
corticosteroids and at least 1 other immunosuppress	ive
agent (i.e., azathioprine, cyclosporine, mycophenolat	
mofetil, methotrexate, tacrolimus, cyclophosphamide).
b) Initial treatment will be authorized for 6 months.	
Recertification will be authorized for 12 months at a t	
3) Pre-operative management (e.g., prior to thymectomy o	r other
surgery):	
a) Short term therapy is considered medically necessar 1-month approval	y tor a
4) "Bridge" therapy to slower acting immunosuppressive the	erany.
a) Short term therapy is considered medically necessar	
month increments to allow adequate time for	, -
immunosuppressive therapy to take full effect.	

	5) Immune globulin therapy will not be authorized in in combination with Neonatal Fc Receptor (FcRn) Antagonists (Vyvgart, Vyvgart Hytrulo, Rystiggo) when being used to treat chronic myasthenia gravis, as this combination has not been studied. When immune globulin is used in the setting of myasthenia crisis, use in combination with a FcRn antagonist is permitted.
Kawasaki Disease	Only used for treatment during the 1 st ten days of diagnosis. IVIG is not effective if more than ten days after onset of symptoms. Diagnosis must be established; there is no specific lab test; diagnosis is established by meeting the following criteria: 1) Fever present for at least 5 days; AND 2) Four of the following 5 conditions are met: a) Mucous membrane changes such as a red tongue and dry fissured lips; b) Swelling of the hands and feet; c) Enlarged lymph nodes in the neck; d) Diffuse red rash covering most of the body; e) Redness of the eyes 3) IVIG dose is 2,000 mg/kg, as a single infusion over 8-12 hours (single dose has been demonstrated to be more effective than 400 mg/kg/day for 5 days).
Prevention of bacterial infection in HIV	For use in pediatric HIV infected members who meet ANY of the
infected children	 following criteria: Member is less than 13 years of age Serum IgG concentration less than 250mg/dL. Recurrent serious bacterial infections defined as 2 or more infections such as bacteremia, meningitis, or pneumonia in a one-year period. Failure to form antibodies to common antigens such as measles, pneumococcal, and/or Haemophilus influzenzae type B vaccine. Living in areas where measles is highly prevalent and who have not developed an antibody response after two doses of measles, mumps, and rubella live virus vaccine. Exposure to measles (one dose only) Chronic bronchiectasis that is suboptimally responsive to antimicrobial and pulmonary therapy. IVIG dose is 400 mg/kg every 4 weeks.
Multifocal Motor Neuropathy	 IVIG is covered first line. Must have documentation of baseline score on an objective scale to assess clinical response (e.g., Rankin, Modified Rankin, Medical Research Council (MRC)). IVIG dose is 500 - 2,400 mg/kg per month (typically, dose infused over 2 to 5 days-i.e., can be given as 1,000 mg/kg/day for 2 days, or 400 mg/kg/day for 5 days). Initial approval will be for 6 months; Recertification requests will be authorized for 2 years at a time and requires documentation of clinical improvement from baseline on the objective scale used for the initial request (e.g., Rankin, Modified Rankin, Medical Research Council (MRC), Inflammatory Neuropathy Cause and Treatment (INCAT)).

	5)	Requested dosing should be based on patient's ideal body weight and should remain within recommended guidelines
		stated above.
		a. If titration of the original dose is required, there must be
		documentation of titration to the minimum dose and
Observation In the second to the December of the second to	4)	frequency needed to maintain sustained clinical effect.
Chronic Inflammatory Demyelinating	1)	Member must have symmetric or focal neurologic deficits with
Polyneuropathy (CIDP)		slowly progressive or relapsing course over 2 months or longer with neurophysiological abnormalities
	2)	Must have documentation of baseline score on an objective
		scale to assess clinical response (e.g., Rankin, Modified
		Rankin, Medical Research Council (MRC), Inflammatory
		Rasch-built Overall Disability Scale (I-RODS), Inflammatory
		Neuropathy Cause and Treatment (INCAT) disability scale).
	3)	IVIG dose is 2,000 mg/kg per month (dose infused over 2 to 5
		days- can be given as 1,000 mg/kg/day for 2 days, or 400 mg/kg/day for 5 days)
	4)	Initial approval will be for 3 months. Recertification requests
		will be authorized for 2 years at a time and requires
		documentation of clinical improvement from baseline on an
		objective scale used for the initial request (e.g., Rankin,
		Modified Rankin, Medical Research Council (MRC),
		Inflammatory Rasch-built Overall Disability Scale (I-RODS),
		Inflammatory Neuropathy Cause and Treatment (INCAT)
	 \	disability scale).
	5)	Requested dosing should be based on patient's ideal body
		weight and should remain within recommended guidelines stated above.
		a. If titration of the original dose is required, there must be
		documentation of titration to the minimum dose and
	٥)	frequency needed to maintain sustained clinical effect.
	6)	Immune globulin therapy will not be authorized in combination
		with Vyvgart Hytrulo for maintenance use. Allowances may be
		made for brief overlap in the setting of acute immune globulin
	71	use or transitioning between treatments.
	()	Note: IVIG is recommended under accepted guidelines as an alternative to plasma exchange in children and adults, or when
		there is difficulty with venous access for plasmapheresis.
Refractory dermatomyositis, Polymyositis	1)	Diagnosis established by biopsy, EMG abnormalities, and/or
Trondotory definationly ositis, i orymyositis	''	increased CPK levels.
	2)	Member has failed a trial or is intolerant of 1 st and 2 nd line
	_,	therapies
		a. Corticosteroids are 1 st line therapy
		b. Immunosuppressants are 2 nd line therapy (ex:
		methotrexate, azathioprine, cyclophosphamide)
	3)	IVIG dose is 2,000 mg/kg per month (dose infused over 2 to 5
		days- can be given as 1,000 mg/kg/day for 2 days, or 400
		mg/kg/day for 5 days).
	4)	Initial approval will be for 6 months. If further IVIG therapy is
		required, documentation of efficacy of the initial 6 months of
		therapy must be submitted. Subsequent approvals will be for 2
		years.

Intravenous Immune Globulin (IVIG) & Sub-Cutaneous Immune Globulin (SCIG) Therapy

III. Based upon our criteria and review of the peer-reviewed literature, IVIG has been medically proven effective and is considered **medically appropriate** for the following off label indications when other treatments or interventions have been unsuccessful or are contraindicated:

INDICATION	CRITERIA
Guillain-Barre Syndrome	 Severe Guillain-Barre Syndrome defined as having significant weakness such as inability to walk or stand without aid, respiratory weakness, or bulbar weakness; or Miller-Fisher Syndrome; AND The disorder has been diagnosed in the 1st two weeks of the illness; AND IVIG is initiated within 1 month of onset of symptoms. IVIG dose is 2,000 mg/kg per month (dose infused over 2 to 5 days- can be given as 1,000 mg/kg/day for 2 days, or 400
Neonates predisposed to Group B strep infections	 mg/kg/day for 5 days). Member must have total IgG less than 400mg/dL; AND Member must have low birth weight of less than 1500 mg: OR Member must be in setting with high baseline infection rate or morbidity.
Autoimmune hemolytic anemia or acquired Factor VIII or Factor IX inhibitors	 Member must have warm-type autoimmune hemolytic anemia Member does not respond to, is intolerant of, or contraindicated to corticosteroids or splenectomy.
Fetal or natal alloimmune thrombocytopenia (FAIT) also known as Neonatal alloimmune thrombocytopenia (NAIT)	Documented Diagnosis of FAIT. IVIG dose is 1,000 mg/kg per week until delivery
HIV-associated thrombocytopenia	 Adults: Significant bleeding in Thrombocytopenic members or platelet count less than 20,000u/mm³; AND Failure of RhIG in Rh-positive patients IVIG dose for adults is 400 mg/kg every 2 to 4 weeks. Pediatric (infants and children <13 years of age) IgG level is <400mg/dL; AND Two or more bacterial infections in a 1-year period despite antibiotic chemoprophylaxis with TMP-SMZ or another active agent; OR Child has received 2 doses of measles vaccine and lives in a region with a high prevalence of measles; OR Member has HIV associated thrombocytopenia despite antiretroviral therapy: OR Member has chronic bronchiectasis that is suboptimally responsive to antimicrobial and pulmonary therapy; OR T4 cell count is greater than or equal to 200mm³. IVIG dose for pediatric patients is 400 mg/kg every 4 weeks.
Parvovirus B19 infection red cell aplasia	Member must have severe, refractory anemia with documented Parvovirus B19 viremia. IVIG dose is 400 mg/kg/day for 5 to 10 days
Acquired Factor VIII inhibitor	Member must have sufficient trials with conventional therapy. Such treatment options include, but not limited to immunosuppressive therapy with corticosteroids, cyclosporine, or azathioprine. A sufficient course is usually 6 to 12 weeks.

Organ Transplant	1) Prior to solid organ transplant, when patient is at high risk for
organ Transplant	antibody-mediated rejection, including highly sensitized
	patients, and those receiving an ABO incompatible organ; OR
	2) Following solid organ transplant
	3) IVIG dose is 2,000 mg/kg per month (dose infused over 2 to 5
	days- can be given as 1,000 mg/kg/day for 2 days, or 400
	mg/kg/day for 5 days), typically for up to 4 cycles.
Post-Transfusion purpura (PTP)	Member must have platelets < 10,000/mm
1 ost Transidoion purpura (1 11)	2) Recommended IVIG dose is 500mg/kg/day for two
	consecutive days.
Hemolytic disease of newborn	Member must not be responding to phototherapy to decrease
Thermolytic disease of thewborn	the need for exchange transfusion.
	2) Therapy should be given to patients with severe hemolysis.
	3) IVIG dose is 500-1,000mg/kg, as a single dose in the first few
	hours of life.
Autoimmuno Muoscutanocus Plistoring	Diagnosis is proven by biopsy, AND
Autoimmune Mucocutaneous Blistering	1 ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '
<u>Diseases</u> :	2) Condition is rapidly progressing, extensive or debilitating, AND3) Member has had a failure or intolerance to conventional
Bullous Pemphigoid, Cicatrical Pemphigoid	'
. •	agents such as corticosteroids and immunosuppressants.
Epidermolysis Bulossa Acquista	4) IVIG may be used in members with rapidly progressive
Mucous Membrane Pemphigoid	disease in whom a clinical response could not be affected
Pemphigus Vulgaris	quickly enough using conventional agents. In such situations,
Pemphigus Foliaceus	IVIG therapy would be given along with conventional
	treatment, and the IVIG would only be used until conventional
	therapy could take effect.
	5) IVIG dose is typically 2,000 mg/kg (dose is infused over 2 to 5
	days. Examples of dosing include 1,000 mg/kg/day for 2 days,
	or 400 mg/kg/day for 5 days), however, for a diagnosis of
	Cicatrical pemphigoid the IVIG dose is 2 to 3 g/kg total dose
	over 3 days every 2 to 6 weeks.
	6) IVIG therapy must be used for short-term therapy and not as
	maintenance therapy. Regular use of repeated courses of
	IVIG for a continuous cycle of exacerbation and remission constitutes maintenance therapy.
Moersch-Woltman (Stiff-man) Syndrome	Presence of Anti-GAD antibody; and
Moersch-Wollman (Stin-man) Syndrome	, , , , , , , , , , , , , , , , , , ,
	2) Benzodiazepines and/or baclofen, phenytoin, clonidine, tizanidine, have failed.
	3) IVIG dose is 2,000 mg/kg per month dose infused over 2 to 5
	days- can be given as 1,000 mg/kg/day for 2 days, or 400
Lambort-Eaton myasthania ayadrama	mg/kg/day for 5 days).
Lambert-Eaton myasthenic syndrome	Treatment options are ineffective or not tolerated. Examples include but are not limited to pyridestigming bromide.
	include but are not limited to, pyridostigmine bromide,
	azathioprine, and prednisone. 2) IVIG dose is 2,000 mg/kg (dose infused over 2 to 5 days- can
	be given as 1,000 mg/kg/day for 2 days, or 400 mg/kg/day for 5
	days).
Birdshot (vitiligenous) retinochoroidopathy	4) Insufficient response to immunosuppressives (corticosteroids,
Birdshot (vitiligenous) retiriochoroldopatity	cyclosporine)
Noonatal hamaahramatasia pranhulasia	• • •
Neonatal hemochromatosis, prophylaxis	1) Treatment of pregnant women who have a history of
	pregnancy ended in neonatal hemochromatosis
	2) IVIG dose should be 1g/kg weekly from the 18 th week until the
Lhun a vina na una a alabadia a maia. El accada a ma	end of gestation
Hyperimmunoglobulinemia E syndrome	1) Recurrent staphylococcal abscesses and markedly elevated
(Job Syndrome; Hyper IgE syndrome)	serum IgE with normal IgG, IgA, and IgM concentrations.

	2) IVIG dose is 300-600 mg/kg, given every 3 to 4 weeks and titrated to response.
Opsoclonus-myoclonus	Last-resort treatment for refractory opsoclonus-myoclonus. I IVIG dose is 400 – 1,000 mg/kg given monthly.
Stapylococcal Toxic Shock syndrome	 Severe cases of toxic shock syndrome that have not responded to fluids and vasopressors. IVIG dose is 2,000 mg/kg dose (infused as 400 mg/kg/day for 5 days).
Rasmussen Encephalitis	 Trial and failure with anti-epileptic drugs and corticosteroids. IVIG is not recommended for long term therapy for Rasmussen's Encephalitis as surgical treatment is the current standard of care. IVIG dose is 2,000 mg/kg (dose infused over 2 to 5 days- can be given as 1,000 mg/kg/day for 2 days, or 400 mg/kg/day for 5 days).
Churg-Strauss Syndrome (CSS)	Diagnosis of severe CSS Trial and failure of previous treatment options
Stevens-Johnson Syndrome	Medically necessary in severe cases of toxic epidermal necrolysis and Stevens-Johnson syndrome
Pediatric Intractable Epilepsy	 For members who are candidates for surgical resection or when other interventions are ineffective or not tolerated. Examples of other interventions include, but are not limited to, anticonvulsant medications, ketogenic diets, and steroids
Acute Disseminated Encephalomyelitis	Insufficient response to intravenous corticosteroid treatment

- IV. Based upon our criteria and review of the peer-review literature IVIG and SCIG therapy for the treatment of all other indications have not been proven to be medically effective and remains **investigational**. The clinical evidence does not support the use of IVIG therapy for all indications including, but not limited to, the following:
 - Acute Lymphoblastic Anemia
 - Acute Renal Failure
 - Adrenoleukodystrophy
 - Alzheimer's disease
 - Amyotrophic Lateral Sclerosis (ALS)
 - Aplastic Anemia
 - Asthma
 - Atopic Dermatitis
 - Autism
 - Autoimmune autonomic neuropathy
 - Autoimmune liver disease
 - Behcet's Syndrome
 - Chronic Fatigue Syndrome
 - Cardiomyopathy
 - Chronic Fatigue Syndrome
 - Chronic Sinusitis
 - Cystic Fibrosis
 - Demyelinating Optic Neuritis
 - Diabetes
 - Diamond-Blackfan Anemia
 - Eczema

Intravenous Immune Globulin (IVIG) & Sub-Cutaneous Immune Globulin (SCIG) Therapy

- Fahr's Disease
- Endotoxemia
- Erythroblastosis Fetalis
- Goodpasture's Syndrome
- Hemolytic Uremic Syndrome
- Immune-related Neutropenia
- Inclusion body myositis
- Lumbosacral plexopathy
- Motor neuron syndromes
- Multiple Sclerosis
- Narcolepsy/cataplexy
- Neonatal hemolytic disease
- Nephropathy, membranous
- Nephrotic Syndrome
- Nonimmune thrombocytopenia
- · Ophthalmopathy, euthyroid
- Otitis Media
- Paraproteinemic neuropathy
- Polyarteritis Nodosa
- Polyneuritis
- Post Infection Sequelae
- Post-polio syndrome
- Recent onset dilated cardiomyopathy
- Recurrent spontaneous abortion
- Reiter's syndrome
- Scleroderma
- Septic Shock
- Rheumatoid Arthritis
- Still's disease
- Thrombotic Thrombocytopenic purpura
- Tic Disorder
- Urticaria
- Uveitis
- Vasculitic syndromes
- Wegener's Granulomatosis

V. Subcutaneous Ig administered (only) products

Subcutaneous Ig (SC) products

Cutaquig, Cuvitru, Hizentra, HyQvia, Xembify

- In addition to the requirements for diagnosis as indicated above for IVIG products, coverage will require documentation of drug failure or serious side effects with two of the following administered subcutaneously: Gamunex-C, Gammaked or Gammagard Liquid.
 - This step does not apply for a diagnosis of ITP (idiopathic (immune) thrombocytopenic purpura), as there is risk of hematoma formation.
 - This applies to all lines of business EXCEPT Medicare Part B.

Intravenous Immune Globulin (IVIG) & Sub-Cutaneous Immune Globulin (SCIG) Therapy

APPROVAL TIME PERIODS:

Line of Business	Initial approval	Recertification
Commercial, Exchange, SafetyNet (Medicaid, Harp, CHP, Essential Plan)	All sites of service – 2 years	All sites of service – 2 years
Medicare	All sites of service – 2 years	All sites of service – 2 years

POLICY GUIDELINES:

- 1. Utilization Management are contract dependent and coverage criteria may be dependent on the contract renewal date. Additionally, coverage of drugs listed in this policy are contract dependent. Refer to specific contract/benefit language for exclusions.
 - A. IVIG and SCIG will be covered under the medical benefit, however, select benefits may allow for coverage under the pharmacy benefit.
- 2. For contracts where Insurance Law § 4903(c-1), and Public Health Law § 4903(3-a) are applicable, if trial of preferred drug(s) is the only criterion that is not met for a given condition, and one of the following circumstances can be substantiated by the requesting provider, then trial of the preferred drug(s) will not be required.
 - The required prescription drug(s) is (are) contraindicated or will likely cause an adverse reaction or physical or mental harm to the member;
 - The required prescription drug is expected to be ineffective based on the known clinical history and conditions and concurrent drug regimen;
 - The required prescription drug(s) was (were) previously tried while under the current or a
 previous health plan, or another prescription drug or drugs in the same pharmacologic class or
 with the same mechanism of action was (were) previously tried and such prescription drug(s)
 was (were) discontinued due to lack of efficacy or effectiveness, diminished effect, or an
 adverse event;
 - The required prescription drug(s) is (are) not in the patient's best interest because it will likely
 cause a significant barrier to adherence to or compliance with the plan of care, will likely
 worsen a comorbid condition, or will likely decrease the ability to achieve or maintain
 reasonable functional ability in performing daily activities;
 - The individual is stable on the requested prescription drug. The medical profile of the individual (age, disease state, comorbidities), along with the rational for deeming stability as it relates to standard medical practice and evidence-based practice protocols for the disease state will be taken into consideration.
 - The above criteria are not applicable to requests for brand name medications that have an AB rated generic. We can require a trial of an AB-rated generic equivalent prior to providing coverage for the equivalent brand name prescription drug
- 3. Continued approval at time of recertification will require documentation that the drug is providing ongoing benefit to the patient in terms of improvement or stability in disease state or condition. Such documentation may include progress notes, imaging or laboratory findings, and other objective or subjective measures of benefit which support that continued use of the requested product is medically necessary. Also, ongoing use of the requested product must continue to reflect the current policy's preferred formulary. Recertification reviews may result in the requirement to try more cost-effective treatment alternatives as they become available (i.e., generics, biosimilars, or other guideline-supported treatment options). Requested dosing must continue to be consistent with FDA-approved or off-label/guideline-supported dosing recommendations.
- 4. The following may be used for clinical evaluation of suspected cases of immunodeficiency:

- A. Measurement of quantitative immunoglobulins (IgG, IgA, IgM); it is important to compare patient results with age-matched ranges since significant differences exist between infants, children, and adults. There are no rigid standards regarding the diagnosis of immunoglobulin deficiency although an IgG value below 600mg/dl, other than in early childhood is suggestive of antibody deficiency.
- B. IgA and IgM may be absent or present in normal amounts; and
- C. It may be appropriate to measure IgG subclasses. For subclass deficiency, a serum IgG subclass trough level should be monitored at least every three months prior to the dose of IVIG and SCIG, along with clinical progress of signs and symptoms for which intravenous immune globulin therapy is required.
- 5. Patient may be recommended for rapidly progressive forms of these diseases.
- 6. Approved dosing for IVIG and SCIG products will be based on the patient's ideal body weight (IBW) on initial and recertification requests (see exception criteria below):
 - IBW (males): 50 kg + (2.3 kg for each inch over 5 feet)
 - IBW (females): 45.5 kg + (2.3 kg for each inch over 5 feet)
- 7. IVIG products will not be approved for subcutaneous use unless FDA approved for that route of administration.
- 8. Recertification for continued use of IVIG therapy will require documentation of clinical efficacy and treatment to desired outcomes.
 - A. For autoimmune disorders, including Primary Humoral Immunodeficiency and Acquired/Secondary Humoral Immunodeficiency with recurrent infections and Hypogammaglobulinemia, recertification will require documentation of:
 - 1. Reduction/elimination of persistent bacterial infections
 - 2. Reduction/elimination of hospitalization related to infectious illness
 - 3. Stable disease
 - 4. Lab values showing normalized trough IgG (ideally greater than 600 mg/dL) are **not** required but can be considered when documenting treatment to desired outcome.
 - 5. Requested dosing should be based on patient's ideal body weight and should remain within recommended guidelines stated in policy above
 - a. Exception: Primary Humoral Immunodeficiencies may approve a higher dose, not based on IBW, when requested dose is based on the individual's clinical response
 - B. For all other conditions (where recertification criteria are not otherwise specified) recertification will require documentation of:
 - 1. Stable disease (maintenance of desired clinical outcome)
 - 2. Requested dosing should be based on patient's ideal body weight and should remain within recommended guidelines stated in policy above.
 - a. Exception: hyperimmunoglobulinemia E syndrome may approve a higher dose, not based on IBW, when requested dose is based on the individual's clinical response.
 - b. If titration of the original dose is required, there must be documentation of titration to the minimum dose and frequency needed to maintain sustained clinical effect.
- 9. This policy does not apply to Medicare Part D and D-SNP pharmacy benefits. The drugs in this policy may apply to all other lines of business including Medicare Advantage.
- 10. For members with Medicare Advantage, medications with a National Coverage Determination (NCD) and/or Local Coverage Determination (LCD) will be covered pursuant to the criteria outlined by the NCD and/or LCD. NCDs/LCDs for applicable medications can be found on the CMS website at https://www.cms.gov/medicare-coverage-database/search.aspx. Indications that have not been addressed by the applicable medication's LCD/NCD will be covered in accordance with criteria determined by the Health Plan (which may include review per the Health Plan's Off-Label Use of FDA Approved Drugs policy). Step therapy requirements may be imposed in addition to LCD/NCD requirements.

Intravenous Immune Globulin (IVIG) & Sub-Cutaneous Immune Globulin (SCIG) Therapy

- 11. All requests will be reviewed to ensure they are being used for an appropriate indication and may be subject to an off-label review in accordance with our Off-Label Use of FDA Approved Drugs Policy (Pharmacy-32).
- 12. All utilization management requirements outlined in this policy are compliant with applicable New York State insurance laws and regulations. Policies will be reviewed and updated as necessary to ensure ongoing compliance with all state and federally mandated coverage requirements.

RATIONALE:

There is no compelling evidence that IVIG is effective for patients with Relapsing Remitting Multiple Sclerosis. The 2002 AAN guidelines on MS concluded that studies to date have involved small numbers of patients, have lacked complete data on clinical and MRI outcomes, or have used methods that have been questioned.²⁹ In addition, a 2008 double blind placebo-controlled trial of 127 patients with RRMS found that IVIG treatment conferred no benefit for reducing relapses or new lesions on MRI.²⁴

The FDA has approved a number of IVIG preparations for use in patients with primary immunodeficiency disorder, idiopathic (immune) thrombocytopenic purpura, chronic lymphocytic leukemia, or Kawasaki syndrome, and as prophylaxis in pediatric HIV patients and allogeneic bone marrow transplant recipients. The FDA has approved one SCIG for use in patients with primary immunodeficiency disorder.

Off label use of IVIG for myasthenia gravis, Guillain-Barre syndrome, has evidence that was obtained from at least one properly designed randomized controlled trial. Evidence has also been obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments could also be regarded as this type of evidence.

The patients for whom IVIG therapy would be used would have failed all other conservative therapies or become refractory to their effects.

Treatment of fetal or neonatal alloimmune thrombocytopenia with maternal IVIG infusions is associated with an increase in the fetal platelet count. A randomized trial compared weekly IVIG with and without associated dexamethasone. Although there was no placebo-controlled arm, results were compared to the course in a prior affected sibling, since the natural history of the disease suggests that subsequent births should be similarly if not more severely affected with thrombocytopenia.

IVIG use in the treatment of acquired factor VIII inhibitors is usually given as part of a combined immunomodulatory protocol. Recent literature suggests that IVIG should be considered only as second-line immunosuppressive therapy for acquired hemophilia.

Multiple small case studies support the use of IVIG to treat pure red cell aplasia secondary to parvovirus B19 viremia. Commercial IVIG is known to contain IgG antibodies to PV B19, which can control and possibly eradicate PV B19. Profound PRCA secondary to PV B19 infection usually occurs in patients who are immunocompromised.

Guidelines from the AAP regarding Hemolytic Disease of the Newborn state that in isoimmune hemolytic disease, administration of IVIG is recommended if the total serum, bilirubin is rising despite intensive phototherapy, or the total serum bilirubin level is within 2 to 3 mg/dL of the exchange level. IVIG has been shown to reduce the need for exchange transfusions in Rh and ABO hemolytic disease.

Intravenous Immune Globulin (IVIG) & Sub-Cutaneous Immune Globulin (SCIG) Therapy

CODES: Number Description

Eligibility for reimbursement is based upon the benefits set forth in the member's subscriber contract. CODES MAY NOT BE COVERED UNDER ALL CIRCUMSTANCES. PLEASE READ THE POLICY AND GUIDELINES STATEMENTS CAREFULLY.

Codes may not be all inclusive as the AMA and CMS code updates may occur more frequently than policy updates.

Code Key: Experimental/Investigational = (E/I), Not medically necessary/ appropriate = (NMN). Copyright © 2006 American Medical Association, Chicago, IL

eniv

J1552 Alyglo J1556 Bivigam J1551 Cutaquig J1555 Cuvitru

J1572 Flebogamma

J1569 Gammagard Liquid

J1566 Gammagard S/D (powder)

Gammaked J1561 J1557 Gammaplex J1561 Gamunex-C Hizentra J1559 J1575 Hygvia Octagam J1568 J1576 Panzyga J1459 Privigen Xembify J1558

<u>UPDATES</u>:

Date	Revision
05/08/2025	Reviewed / P&T Committee Approval
04/28/2025	Revised
03/10/2025	Revised
03/06/2025	Revised
01/13/2025	Revised
01/01/2025	Revised
12/15/2024	Revised
11/21/2024	P&T Committee Review / Approval
06/20/2024	Revised
04/05/2024	Revised
03/11/2024	Revised
02/15/2024	Revised
11/30/2023	P&T Committee Approval
10/2023	Revised
07/2023	Revised
03/2023	Revised

Intravenous Immune Globulin (IVIG) & Sub-Cutaneous Immune Globulin (SCIG) Therapy

12/2022	Revised
11/17/2022	P&T Committee Approval
11/2022	Revised
06/2022	Revised
01/2022	Revised
11/24/2021	P&T Committee Approval
11/2021	Revised
4/2021	Revised
2/2021	Revised
11/12/2020	P&T Committee Approval
10/2020	Revised
9/2020	Revised
3/2020	Revised
10/2019	Revised
9/2019	Revised
5/2019	Revised
2/2019	P&T Committee Approval
11/2018	Revised
8/2018	Revised
10/2017	Revised
9/14/2017	P&T Committee Approval
4/2017	Revised
9/2016	Revised
1/2016	Revised
5/2015	Revised
10/2014	Revised
9/2014	Revised
3/2014	Revised
2/2014	Revised
11/2013	Revised
7/2012	Revised
3/2012	Revised
8/2011	Revised
12/2010	Revised
4/2010	Revised
3/2010	Revised
9/2009	Revised
5/2009	Revised
2/2009	Revised
9/2008	Revised
9/2007	Revised
10/2006	Created

REFERENCES:

- 1. Ahmed A, et al. Consensus statement on the use of intravenous immunoglobulin therapy in the treatment of autoimmune mucocutaneous blistering diseases. <u>Arch Dermatol</u> 2003 Aug;139:1051-9.
- 2. Aktas O, et al. Polyspecific immunoglobulins (IVIG) suppress proliferation of human (auto) antigen-specific T cells without inducing apoptosis. <u>J Neuroimmunol</u> 2001 Mar 1;114(1-20):160-7.

- 3. Alejandria MM, et al. Intravenous immunoglobulin for treating sepsis and septic shock (Cochrane Review). The Cochrane Library. 2002;1:CD001090.
- 4. Amagai M, et al. A Randomized double-blind trial of intravenous immunoglobulin for pemphigus. J Am Acad Dermatol 2009; 60(4):595-603.
- 5. American Academy of Pediatrics, Subcommittee on Hyperbilirubinemia. Management of hyperbilirubinemia in the newborn infant 35 or more weeks of gestation. Ped 2004 Jul;114(1):297-316.
- 6. American College of Obstetricians and Gynecologists (ACOG) Practice Bulletin, Thrombocytopenia in Pregnancy, Number 6, September 1999
- 7. American Hospital Formulary Service, Drug Information, 2005
- 8. Bachot N, et al. Intravenous immunoglobulin in the treatment for Stevens-Johnson syndrome and toxic epidermal necrolysis: a prospective noncomparative study showing no benefit on mortality or progression. <u>Arch Dermatol</u> 2003 Jan;139(1):33-6.
- 9. Bachot N, Roujeau JC. Intravenous immunoglobulin in the treatment of severe drug eruptions. <u>Curr Opin Allergy Clin Immunol</u> 2003 Aug:3(4):269-74.
- 10. Bayry J, et al. Intravenous immunoglobulin for infectious diseases: back to the pre-antibiotic and passive prophylaxis era? <u>Trends Pharmacol Sci</u> 2004 Jun;25(6):306-10.
- 11. BlueCross BlueShield Association. Medical Policy Reference Manual Policy #8.01.05. 2004 Apr 16.
- 12. Bonagura V, et al. Biologic IgG level in primary immunodeficiency disease: The IgG level that protects against recurrent infection. J Allergy Clin Immunol. July 2008;122(1):210-211.
- 13. Bussel, JB et al. Antenatal management of alloimmune thrombocytopenia with Intravenous Immunoglobulin: A randomized trial of the low dose steroid to intravenous immunoglobulin. <u>Am J Obstet Gynecol</u> 1996; 174 1414-23
- 14. Centers for Disease Control and Prevention. Guidelines for the Prevention and Treatment of Opportunistic Infections Among HIV-Exposed and HIV-Infected Children. MMWR 2009;58(No. RR-11):11-12.
- 15. Centers for Medicare and Medicaid Services (CMS). Intravenous immune globulin for autoimmune mucocutaneous blistering diseases. CPG-00109N. 2002 Jan [http://www.cms.hhs.gov/mcd/viewncd.asp?ncd_id=250.3&ncd_version=1 &show=all] accessed 10/26/04.
- Centers for Medicare and Medicaid Services. New York State Policy. Intravenous Immune Globulin (IVIG). DR007E01. 2001 [http://www.umd.nycpic.com/cgi-bin/bookmgr/bookmgr.cmd/BOOKS/DR007E04/FRONT] accessed 10/26/04.
- 17. Chapel HM, Spickett GP, Ericson D, Engl W, Eibl MM, Bjorkander J. The comparison of the efficacy and safety of intravenous versus subcutaneous immunoglobulin replacement therapy. <u>J Clin Immunol</u>. 2000;20(2):94-100.
- 18. Chu, YW et al, Idiopathic thrombocytopenia purpura. Pediatrics in Review, 2000; 21(3) 94-105
- 19. Clegg A, et al. Immunomodulatory drugs for multiple sclerosis: a systemic review of clinical and cost effectiveness. Expert Opin Pharmacother 2001 Apr;2(4):623-39.
- 20. Cordonnier C, et al. Should immunoglobulin therapy be used in allogeneic stem-cell transplantation? A randomized, double-blind, dose effect, placebo-controlled, multicenter trial. <u>Ann Intern Med 2003 Jul 1;139(1):8-18.</u>
- 21. Dalakas MC, et al. High-dose intravenous immune globulin for stiff-person syndrome. <u>NEJM</u> 2001;345(26):1870-6.
- 22. Dalakas MC. Intravenous immunoglobulin in autoimmune neuromuscular diseases. <u>JAMA</u> 2004 May19;291(19):2367-75.
- 23. Darenberg J, et al. Intravenous immunoglobulin G therapy in streptococcal toxic shock syndrome: a European randomized, double-blind, placebo-controlled trial. Clin Infect Dis 2003 Aug 1;37(3):333-40.
- 24. EFNS guidelines for the use of intravenous immunoglobulin in treatment of neurological diseases. European Journal of Neurology 2008 15:893-908.
- 25. Fanaroff AA, et al. A controlled trial of intravenous immune globulin to reduce nosocomial infections in very low birth weight infants. NEJM 1994;330 (16) 1107-1113.
- 26. Fazekas F, et al. Intravenous immunoglobulin in relapsing-remitting multiple sclerosis: a dose finding trial. Neurology 2008 Jul 22;71(4):265-271.
- 27. Feasby Inc. Medical Technology Directory. Intravenous Immunoglobulin for Myasthenia Gravis. Lansdale, PA: Hayes, Inc; October 5, 2012
- 28. Gajdos P, et al. Immunoglobulin for myasthenia gravis. The Cochrane Library. 2003;2:CD002277.

- 29. Gajdos P, Chevrey S, Toyka K. Intravenous immunoglobulin for myasthenia gravis. The Cochrane Database of Systemic Reviews. 17 Jan 2006.
- 30. Glotz, D. et al. Intravenous immunoglobulins and transplantation for patients with anti-HLA antibodies. Transpl Int 2004 Jan;17(1):1-8.
- 31. Gonzalez H, et al. Prior poliomyelitis-IVIg treatment reduces proinflammatory cytokine production. <u>J</u> Neuroimmunol 2004 May;150(1-2):139-44.
- 32. Goodin, DS, Frohman, EM, et al. Disease modifying therapies in multiple sclerosis: Subcommittee of the American Academy of Neurology and the MS Council for Clinical Practice Guidelines. Neurology 2002; 58:169
- 33. Gray OM, et al. Intravenous immunoglobulins for multiple sclerosis. The Cochrane Library. 2004;(1):CD002936
- 34. Hamilos DL, Christensen J. Treatment of Churg-Strauss syndrome with high-dose intravenous immunoglobulin. J Allergy Clin Immunol. 1991;88(5):823-824.
- 35. Hebert AA, Bogle MA. Intravenous immunoglobulin prophylaxis for recurrent Stevens-Johnson syndrome. J Am Acad Dermatol. 2004;50(2):286-288.
- 36. Hoekstra PJ, et al. Lack of effect of intravenous immunoglobulins on tics: a double-blind placebo-controlled study. J Clin Psychiatry 2004 Apr;65(4):537-42.
- 37. Hughes RA, et al. Intravenous immunoglobulin for Guillain-Barre syndrome. The Cochrane Library. 2004;(1):CD002063.
- 38. Hughes RA, et al. Practice parameter: immunotherapy for Guillain-Barre syndrome: report of the Quality Standards Subcommittee of the American Academy of Neurology. <u>Neurol</u> 2003 Sep 23;61(6):736-40.
- 39. Jibiki T, et al Efficacy of intravenous immune globulin therapy combined with dexamethasone for the initial treatment of acute Kawasaki disease. Eur J Pediatr 2004 Apr;163(4-5):229-33. Epub 2004 Feb 13.
- 40. Joint Task Force of the EFNS and the PNS. European Federation of Neurological Societies/Peripheral Nerve Society guideline on management of multifocal motor neuropathy. Report of a joint task force of the European Federation of Neurological Societies and the Peripheral Nerve Society- First revision. J Peripher Nerv Syst.2010 Dec;15(4):295-301.
- 41. Jordan SC, et al. Evaluation of intravenous immunoglobulin as an agent to lower allosensitization and improve transplantation in highly sensitized adult patients with end-stage renal disease: report of the NIH IG02 trial. J Am Soc Nephrol 2004 15:3256-62
- 42. Kimata H. High-dose intravenous gammaglobulin treatment of hyperimmunoglobulinemia E syndrome. J Allergy Clin Immunol. 1995;95:771-774.
- 43. Latov, N. Diagnosis of CIDP. Neurology. 2002 Dec 24;59(12 Suppl 6):S2-6.
- 44. Latov, N et al. Use of intravenous gamma globulins in neuroimmunologic diseases. <u>J. of Allergy and Clinical Immunology.</u> 108 (4) October,2001.
- 45. Levy Y, George J, Fabbrizzi F, et al. Marked improvement of Churg-Strauss vasculitis with intravenous gammaglobulins. South Med J. 1999;92(4):412-414.
- 46. Linker RA, Gold R. Use of intravenous immunoglobulin and plasma exchange in neurological disease. Curr Opin Neurol. 2008;21:358-365.
- 47. Madjok R, Wu O. Systemic lupus erythematosus. In: BMJ Clinical Evidence. London, UK: BMJ Publishing Group; December 2008.
- 48. Medeiros, D et al. Current controversies in the management of idiopathic thrombocytopenia purpura in childhood. <u>Pediatric Clin N America</u> 1996; 43 (3): 757-73
- 49. Metry DW, et al. Use of intravenous immunoglobulin in children with Stevens-Johnson syndrome and toxic epidermal necrolysis: seven cases and a review of the literature. Ped 2003 Dec;112(6 Pt 1):1430-6.
- 50. Miura M, et al. Coronary risk factors in Kawasaki disease treated with additional gammaglobulin. <u>Arch Dis Child</u> 2004 Aug;89(8):776-80.
- 51. Muta H, et al. Early intravenous gamma-globulin treatment for Kawasaki disease: the nationwide surveys in Japan. <u>J Pediatr</u> 2004 Apr;144(4):496-9.
- 52. Neunert C, et al. The American Society of Hematology 2011 evidence-based practice guideline for immune thrombocytopenia. Blood. 2011;117(16):4190-4207.
- 53. NHS Centre for Reviews and Dissemination. The effectiveness of interventions used in the treatment/management of chronic fatigue syndrome and/or myalgic encephalomyelitis in adults and children. York, UK: Centre for Reviews and Dissemination; 2002.

- 54. Nousari HC, Anhalt GJ. Pemphigus and bullous pemphigoid. Lancet. 1999:354:667-672.
- 55. Oats-Whitehead RM, et al. Intravenous immunoglobulin for the treatment of Kawasaki disease in children. Cochrane Database Syst Rev 2003(4):CD004000.
- 56. Ohlsson A, Lacy JB. Intravenous immunoglobulin for preventing infection in preterm and/or low-birth-weight infants. Cochrane Database Syst Rev 2004(1):CD000361.
- 57. Ohlsson A, Lacy JB. Intravenous immunoglobulin for suspected or subsequently proven infection in neonates. Cochrane Database Syst Rev 2004(1):CD001239.
- 58. Orange J, et al. Use of intravenous immunoglobulin in human disease: A review of evidence by members of the Primary Immunodeficiency Committee of the American Academy of Allergy, Asthma, and Immunology. J Allergy Clin Immunol 2006; 117(4 Suppl): S525-53.
- 59. Poehlau D. Treatment of chronic progressive multiple sclerosis with intravenous immunoglobulins interim results on drug safety of an ongoing study. Multiple Sclerosis 2000;6(Suppl 2):S21-3.
- 60. Prins C, et al. Treatment of toxic epidermal necrolysis with high-dose intravenous immunoglobulins: multicenter retrospective analysis of 48 consecutive cases. <u>Arch Dermatol</u> 2003 Jan;139(1):26-32.
- 61. Raanani P, et al. Immunoglobulin prophylaxis in hematopoietic stem cell transplantation: Systematic review and meta-analysis. Journal of Clinical Oncology 2009 Feb;27(5):770-81.
- 62. Reinhold D, et al. Increased blood plasma concentrations of TGF-beta isoforms after treatment with intravenous immunoglobulins (IVIG) in patients with multiple sclerosis. <u>J Neuroimmunol</u> 2004 Jul;152(1-2):191-4.
- 63. Scott JR. Immunotherapy for recurrent miscarriage. Cochrane Database Syst Rev 2003(1):CD000112.
- 64. Selcen D, et al. High-dose intravenous immunoglobulin therapy in juvenile myasthenia gravis. <u>Pediatr Neurol</u> 2000; 22(1):40-3.
- 65. Servin C, Moulin T, Tatu L, et al. "Stiff-man" syndrome treated with intravenous immunoglobulins (letter). Rev Neurol (Paris) 1998; 154(5):431.
- 66. Shortt R, et al. Intravenous immunoglobulin does not improve outcome in toxic epidermal necrolysis. <u>J</u> Burn Care Rehabil 2004 May-Jun;25(3):246-55.
- 67. Skeie G,, Apostolski S, Evoli A, Gilhus NE, et al. Guidelines for the treatment of autoimmune neuromuscular transmission disorders. European Journal of Neurology. 2006; 13:691-699.
- 68. Sorenson PS. The effect on MRI of gammaglobulin treatment in relapsing multiple sclerosis. <u>Multiple Sclerosis</u> (Houndmills, Basingstoke, England) 2000 Oct;6(Suppl 2):S14-7.
- 69. Stasi R, et al. Idiopathic Thrombocytopenic Purpura: current concepts in pathophysiology and management. Thrombosis and Haemostasis 2008;99(1):4-13.
- 70. Stayer C, Meinck HM. Stiff-man syndrome. An overview. Neurologia. 1998; 13(2);83-88
- 71. Stiehm ER, Casillas AM, Finkelstein JZ, Gallagher KT, Groncy PM, Kobayashi RH, et al. Slow subcutaneous human intravenous immunoglobulin in the treatment of antibody immunodeficiency: use of an old method with a new product. <u>J Allergy Clin Immunol</u>. 1998;101(6 Pt 1):848-849.
- 72. Stephenson MD, Fluker MR. Treatment of repeated unexplained in vitro fertilization failure with intravenous immunoglobulin: a randomized, placebo-controlled Canadian trial. <u>Fertil Steril</u> 2000 Dec;74(6):1108-13.
- 73. Sundel R, et al. Corticosteroids in the initial treatment of Kawasaki disease: report of a randomized trial. <u>J Pediatr</u> 2003;142:611-6.
- 74. Tcheurekdjian H, et al. Quality of life in common variable immunodeficiency requiring intravenous immunoglobulin therapy. Ann Allergy Asthma Immunol 2004 Aug;93(2):160-5.
- 75. Teksam M, et al. Qualitative and quantitative volumetric evaluation of the efficacy of IVIG in MS: preliminary report. Neuroradiol 2000 Dec;42(12):885-9.
- 76. Trent JT, et al. Analysis of intravenous immunoglobulin for the treatment of toxic epidermal necrolysis using SCORTEN: The University of Miami Experience. <u>Arch Dermatol</u> 2003 Jan;139(1):39-43.
- 77. University of Michigan Health Center, Departments of Pediatrics and Communicable Diseases. Intravenous Immunoglobulin is effective therapy for acute thrombocytopenia Purpura. Evidence Based Pediatrics Website; January 25, 1999.
- 78. Van den Bergh PY, et al. Eurpean Federation of Neurological Societies/Peripheral Nerve Society guideline on management of chronic inflammatory demyelinating polyradiculoneuropathy: report of a joint task force of the European Federation of Neurological Societies [trunc]. Eur J Neurol 2010 Mar;17(3):356-63.
- 79. Van Koningsveld R, et al. Effect of methylprednisolone when added to standard treatment with intravenous immunoglobulin for Guillain-Barre syndrome: randomized trial. <u>Lancet</u> 2004 Jan 17;363(9404):192-6.

- 80. Verhelst D, et al. Treatment of erythropoietin-induced pure red cell aplasia: a retrospective study. <u>Lancet</u> 2004 May 29;363(9423):1768-71.
- 81. Vivaglobin® package insert. Kankakee, III: ZLB (Behring), Inc.; April, 2007.
- 82. Whitington PF, Kelly S. Outcome of pregnancies at risk for neonatal hemochromatosis is improved by treatment with high-dose intravenous immunoglobulin. Pediatrics. 2008;121(6):e1615-e1621.
- 83. Wringer J, et al. Immunoglobulin treatment versus plasma exchange in patients with chronic moderate to severe myasthenia gravis. <u>Artif Organs</u> 2001; 25(12):967-73.
- 84. USP-DI® Drug Information for the Healthcare Professional, http://thomson.com/ Accessed 15 August 2007.
- 85. Zinman L, Eduardo, Bril V. IV immunoglobulin in patients with myasthenia gravis: A randomized controlled trial. Neurology. 13 March 2007; 68(11): 837-41
- 86. Yuen T. Immune-Mediated Neuropathies. Continuum (Minneap Minn). Feb 2012; 18(1):85-105
- 87. Patwa H, Chaudhry V, Katzberg H, Rae-Grant A, So Y. Evidence based-guideline: Intravenous immunoglobulin in the treatment of neuromuscular disorders: Report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology. Neurology. 27 March 2012; 78(13):1009-1015