Chronic Intermittent Intravenous Insulin Therapy (CIIIT)

Policy #  00015
Original Effective Date: 06/05/2002
Current Effective Date: 05/15/2019

Applies to all products administered or underwritten by Blue Cross and Blue Shield of Louisiana and its subsidiary, HMO Louisiana, Inc. (collectively referred to as the “Company”), unless otherwise provided in the applicable contract. Medical technology is constantly evolving, and we reserve the right to review and update Medical Policy periodically.

Services Are Considered Investigational
Coverage is not available for investigational medical treatments or procedures, drugs, devices or biological products.

Based on review of available data, the Company considers chronic intermittent intravenous insulin (CIIIT) therapy to be investigational.*

Policy Guidelines
This policy does not apply to use of intravenous insulin infusions in the inpatient setting (i.e., for the treatment of diabetic ketoacidosis or diabetic hyperosmolar coma).

Background/Overview
Glucose Homeostasis
Insulin-mediated glucose homeostasis involves three primary functions that occur at three locations: (1) insulin secretion by the pancreas; (2) glucose uptake, primarily in the muscle, liver, gut, and fat; and (3) hepatic glucose production. In the fasting state, when insulin levels are low, most glucose uptake into cells is non-insulin-mediated. Glucose uptake is then balanced by the liver production of glucose. However, after a glucose challenge, insulin binds to specific receptors on the hepatocyte to suppress glucose production. Without this inhibition, marked hyperglycemia may result.

Medications for Glucose Homeostasis in Diabetes
Diabetes is characterized by elevated blood glucose levels due to inadequate or absent insulin production (type 1 diabetes) or due to increased hepatic glucose production, decreased peripheral glucose uptake, and decreased insulin secretion (type 2 diabetes).

The different classes of diabetic drug therapy target different aspects of glucose metabolism. Various insulin secretagogues (e.g., sulfonylureas) function by increasing the pancreatic secretion of insulin;

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thiazolidinediones (eg, pioglitazone [Actos], rosiglitazone [Avandia]) function in part by increasing glucose uptake in the peripheral (principally skeletal) tissues; and biguanides (eg, metformin) function by decreasing hepatic glucose production. While patients with type 2 diabetes may be treated with various combinations of all three of these classes of drugs, with or without additional insulin, patients with type 1 diabetes, who have no baseline insulin secretion, receive exogenous insulin therapy. Standard insulin management involves the use of subcutaneous injection to mimic a physiologic insulin profile. Intravenous insulin is used in the acute inpatient setting to manage hyperglycemic emergencies (eg, diabetic ketoacidosis).

**FDA or Other Governmental Regulatory Approval**

**U.S. Food and Drug Administration (FDA)**

Any insulin infusion pump can be used for chronic intermittent intravenous insulin therapy. Infusion pumps have been cleared for marketing by the U.S. Food and Drug Administration through the 510(k) process. The Food and Drug Administration determined that this device was substantially equivalent to existing devices for the delivery of intravenous medications. Food and Drug Administration product code: lZG.

**Rationale/Source**

Chronic intermittent intravenous insulin therapy (CIIIT) is a technique for delivering variable-dose insulin to diabetic patients with the goal of improved long-term glycemic control. Through an unknown mechanism, CIIIT is postulated to induce insulin-dependent hepatic enzymes to suppress glucose production.

For individuals who have type 1 diabetes who receive CIIIT, the evidence includes two randomized controlled trials and several uncontrolled studies. The relevant outcomes are symptoms, change in disease status, and treatment-related morbidity. A limited number of uncontrolled studies have suggested that CIIIT might improve glycemic control. The two randomized trials have reported that CIIIT might moderate the progression of nephropathy or retinopathy. However, the published studies were small and reported improvements on intermediate outcomes only (ie, changes in laboratory values). The clinical significance of the differences reported in these trials is uncertain. Additionally, most published evidence appeared between 1993 and 2010 and, as a result, does not account for improvements in diabetes care. The evidence is insufficient to determine the effects of the technology on health outcomes.
Supplemental Information

Practice Guidelines and Position Statements
The American Diabetes Association (2019) “Standards of Medical Care in Diabetes” includes the American Diabetes Association’s current clinical practice recommendations and is intended to provide the components of diabetes care, general treatment goals and guidelines, and tools to evaluate the quality of care. The pharmacologic approaches to glycemic treatment are summarized in chapter 9.

U.S. Preventive Services Task Force Recommendations
Not applicable.

Medicare National Coverage
The Centers for Medicare & Medicaid Services (2009) issued a decision memo on the use of outpatient intravenous insulin therapy, which stated:

“Effective … 2009, the Centers for Medicare and Medicaid Services (CMS) determines that the evidence is adequate to conclude that OIVIT [outpatient intravenous insulin therapy; CIIIT] does not improve health outcomes in Medicare beneficiaries. Therefore, CMS determines that OIVIT is not reasonable and necessary…. Services comprising an Outpatient Intravenous Insulin Therapy regimen are nationally non-covered under Medicare when furnished pursuant to an OIVIT regimen…..”

Ongoing and Unpublished Clinical Trials
A search for active or recruiting clinical trials in January 2019 did not yield results for trials that might influence this review.

References
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8. Centers for Medicaid & Medicare Services. National Coverage Determination (NCD) for Outpatient Intravenous Insulin Treatment (40.7). 2009; https://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?NCDId=334&ncdver=1&CoverageSelection=Both&ArticleType=All&PolicyType=Final&s=All&KeyWord=intravenous+insulin&KeyWordLookUp=Title&KeyWordSearchType=And&bc=gAAAACAAAAA%3d%3d&.

Policy History
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04/18/2002 Medical Policy Committee review
06/05/2002 Managed Care Advisory Council approval
06/24/2002 Format revision. No substance change to policy
06/01/2004 Medical Director review
06/15/2004 Medical Policy Committee review. Format revision. No substance change to policy.
06/28/2005 Managed Care Advisory Council approval
03/01/2005 Medical Director review
03/15/2005 Medical Policy Committee review
04/04/2005 Managed Care Advisory Council approval

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07/07/2006  Format revision, including addition of FDA and or other governmental regulatory approval and rationale/source. Coverage eligibility unchanged.
04/04/2007  Medical Director review
04/18/2007  Medical Policy Committee approval. CMS information added. Coverage eligibility unchanged.
03/04/2009  Medical Director review
03/18/2009  Medical Policy Committee approval. No change to coverage.
03/05/2010  Medical Policy Committee review
03/19/2010  Medical Policy Implementation Committee approval. No change to coverage.
03/03/2011  Medical Policy Committee review
03/16/2011  Medical Policy Implementation Committee approval. No change to coverage.
03/01/2012  Medical Policy Committee review
03/21/2012  Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
03/07/2013  Medical Policy Committee review
03/20/2013  Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
03/06/2014  Medical Policy Committee review
03/19/2014  Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
05/07/2015  Medical Policy Committee review
05/20/2015  Medical Policy Implementation Committee approval. Coverage eligibility unchanged
08/03/2015  Coding update: ICD10 Diagnosis code section added; ICD9 Procedure code section removed.
05/05/2016  Medical Policy Committee review
05/18/2016  Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
10/01/2016  Coding update
01/01/2017  Coding update: Removing ICD-9 Diagnosis Codes
05/04/2017  Medical Policy Committee review
05/17/2017  Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
05/03/2018  Medical Policy Committee review

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05/16/2018 Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
05/02/2019 Medical Policy Committee review
05/15/2019 Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
Next Scheduled Review Date: 05/2020

Coding
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Codes used to identify services associated with this policy may include (but may not be limited to) the following:

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*Investigational – A medical treatment, procedure, drug, device, or biological product is Investigational if the effectiveness has not been clearly tested and it has not been incorporated into standard medical practice. Any determination we make that a medical treatment, procedure, drug, device, or biological product is Investigational will be based on a consideration of the following:

A. Whether the medical treatment, procedure, drug, device, or biological product can be lawfully marketed without approval of the U.S. Food and Drug Administration (FDA) and whether such approval has been granted at the time the medical treatment, procedure, drug, device, or biological product is sought to be furnished; or

B. Whether the medical treatment, procedure, drug, device, or biological product requires further studies or clinical trials to determine its maximum tolerated dose, toxicity, safety, effectiveness, or effectiveness as compared with the standard means of treatment or diagnosis, must improve health outcomes, according to the consensus of opinion among experts as shown by reliable evidence, including:

1. Consultation with the Blue Cross and Blue Shield Association technology assessment program (TEC) or other nonaffiliated technology evaluation center(s);
2. Credible scientific evidence published in peer-reviewed medical literature generally recognized by the relevant medical community; or
3. Reference to federal regulations.

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