

Clinical Policy: C1 Esterase Inhibitors (Berinert, Cinryze, Haegarda, Ruconest)

Reference Number: CP.PHAR.202

Effective Date: 03.01.16

Last Review Date: 02.18

Line of Business: Commercial, Medicaid

[Coding Implications](#)

[Revision Log](#)

See [Important Reminder](#) at the end of this policy for important regulatory and legal information.

Description

The following are C1 esterase inhibitors requiring prior authorization: human C1 esterase inhibitor (Berinert[®], Cinryze[®], Haegarda[®]) and recombinant C1 esterase inhibitor (Ruconest[®]).

FDA Approved Indication(s)

C1 esterase inhibitors are indicated:

- For the treatment of acute attacks of hereditary angioedema (HAE) in adolescent and adult patients [*Berinert and Ruconest only*]
- For the routine prophylaxis against angioedema attacks in adolescent and adult patients with HAE [*Cinryze and Haegarda only*]

Limitations of use:

- The safety and efficacy of Berinert for prophylactic therapy have not been established.
- Effectiveness of Ruconest was not established in HAE patients with laryngeal attacks.

Policy/Criteria

Provider must submit documentation (including such as office chart notes, lab results or other clinical information) supporting that member has met all approval criteria.

It is the policy of health plans affiliated with Centene Corporation[®] that Berinert, Cinryze, Haegarda, and Ruconest are **medically necessary** when the following criteria are met:

I. Initial Approval Criteria

A. Hereditary Angioedema (must meet all):

1. Diagnosis of HAE confirmed by one of the following (a or b):
 - a. Low C4 level and low C1-INH antigenic or functional level (*see Appendix C*);
 - b. Normal C4 level and normal C1-INH levels, and both of the following (i and ii):
 - i. History of recurrent angioedema;
 - ii. Family history of angioedema;
2. Prescribed by or in consultation with hematologist, allergist, or immunologist;
3. Member meets one of the following (a, b, or c):
 - a. For treatment of acute HAE attacks, meets one of the following (i or ii):
 - i. Request is for Berinert;
 - ii. Request is for Ruconest and member does not experience laryngeal attacks;
 - b. For long-term prophylaxis of HAE attacks, meets all of the following (i, ii, and iii):
 - i. Request is for Cinryze or Haegarda;

- ii. Patient experiences more than one severe event per month OR is disabled more than five days per month OR the patient has a history of previous airway compromise;
- iii. For postpubertal adolescent and adults: failure of a trial of danazol unless contraindicated or clinically significant adverse effects are experienced;
- c. For short-term prophylaxis of HAE attacks, meets both of the following (i and ii):
 - i. Request is for a plasma-derived C1 esterase inhibitor (i.e., Ruconest, Cinryze, or Haegarda);
 - ii. Member requires major dental work or surgical procedure;
- 4. Dose does not exceed:
 - a. Berinert: 20 IU/kg of body weight IV per dose, up to 2 doses administered in a 24 hour period;
 - b. Cinryze: 2500 units (5 vials) IV every 3-4 days;
 - c. Haegarda: 60 IU/kg of body weight SC per dose twice weekly;
 - d. Ruconest: 4200 IU per single dose, up to 2 doses administered in a 24 hour period.

Approval duration:

Medicaid/Health Insurance Marketplace –

Acute attacks & long-term prophylaxis: 12 months

Short-term prophylaxis: 2 doses per procedure

Commercial –

Acute attacks & long-term prophylaxis: Length of benefit

Short-term prophylaxis: 2 doses per procedure

B. Other diagnoses/indications

- 1. Refer to the off-label use policy for the relevant line of business if diagnosis is NOT specifically listed under section III (Diagnoses/Indications for which coverage is NOT authorized): CP.CPA.09 for commercial for health insurance marketplace, and CP.PMN.53 for Medicaid.

II. Continued Therapy

A. Hereditary Angioedema (must meet all):

- 1. Currently receiving medication via Centene benefit or member has previously met initial approval criteria;
- 2. Member is responding positively to therapy (e.g., if Cinryze or Haegarda are requested, member has demonstrated reduction in attacks from baseline, or request is for a dose increase);
- 3. If request is for a dose increase, new dose does not exceed:
 - e. Berinert: 20 IU/kg of body weight IV per dose, up to 2 doses administered in a 24 hour period;
 - f. Cinryze: 2500 units (5 vials) IV every 3-4 days;
 - g. Haegarda: 60 IU/kg of body weight SC per dose twice weekly;
 - h. Ruconest: 4200 IU per single dose, up to 2 doses administered in a 24 hour period.

Approval duration:

Medicaid/Health Insurance Marketplace –

Acute attacks & long-term prophylaxis: 12 months

Short-term prophylaxis: 2 doses per procedure

Commercial –

Acute attacks & long-term prophylaxis: Length of benefit

Short-term prophylaxis: 2 doses per procedure

B. Other diagnoses/indications (must meet 1 or 2):

1. Currently receiving medication via Centene benefit and documentation supports positive response to therapy.

Approval duration: Duration of request or 6 months (whichever is less); or

2. Refer to the off-label use policy for the relevant line of business if diagnosis is NOT specifically listed under section III (Diagnoses/Indications for which coverage is NOT authorized): CP.CPA.09 for commercial for health insurance marketplace, and CP.PMN.53 for Medicaid.

III. Diagnoses/Indications for which coverage is NOT authorized:

- A. Non-FDA approved indications, which are not addressed in this policy, unless there is sufficient documentation of efficacy and safety according to the off label use policies – CP.CPA.09 for commercial and CP.PMN.53 for Medicaid or evidence of coverage documents.

IV. Appendices/General Information

Appendix A: Abbreviation/Acronym Key

C1-INH: C1 esterase inhibitor

FDA: Food and Drug Administration

HAE: hereditary angioedema

IU: international units

Appendix B: Therapeutic Alternatives

This table provides a listing of preferred alternative therapy recommended in the approval criteria. The drugs listed here may not be a formulary agent for all relevant lines of business and may require prior authorization.

Drug Name	Dosing Regimen	Dose Limit/ Maximum Dose
danazol (Danocrine [®])	<u>Long-term prophylaxis in adults:</u> 200 mg PO BID or TID initially. Maintenance doses determined by decreasing this dose by 50% or less at intervals of 1 to 3 months or longer while edematous attacks are prevented. If an attack occurs, the dose can be increased by up to 200 mg.	Adults: 800 mg/day

Therapeutic alternatives are listed as Brand name[®] (generic) when the drug is available by brand name only and generic (Brand name[®]) when the drug is available by both brand and generic.

Appendix C: General Information

- Diagnosis of HAE:
 - There are two classifications of HAE: HAE with C1-INH deficiency (further broken down into Type 1 and Type II) and HAE of unknown origin (also known as Type III).

- In both Type I (~85% of cases) and Type II (~15% of cases), C4 levels are low. C1-INH antigenic levels are low in Type I while C1-INH functional levels are low in Type II. Diagnosis of Type I and II can be confirmed with laboratory tests. Reference ranges for C4 and C1-INH levels can vary across laboratories (see below for examples); low values confirming diagnosis are those which are below the lower end of normal.

Laboratory Test & Reference Range	Mayo Clinic	Quest Diagnostics	LabCorp
C4	14-40 mg/dL	16-47 mg/dL	9-36 mg/dL
C1-INH, antigenic	19-37 mg/dL	21-39 mg/dL	21-39 mg/dL
C1-INH, functional	Normal: > 67% Equivocal: 41-67% Abnormal: < 41%	Normal: ≥ 68% Equivocal: 41-67% Abnormal: ≤ 40%	Normal: > 67% Equivocal: 41-67% Abnormal: < 41%

- Type III, on the other hand, presents with normal C4 and C1-INH levels. Some patients have an associated mutation in the FXII gene, while others have no identified genetic indicators. Type III is very rare (number of cases unknown), and there are no laboratory tests to confirm the diagnosis. Instead, the diagnosis is clinical and supported by recurrent episodes of angioedema with a strong family history of angioedema.
- Danazol failure: Significant frequent angioedema attacks despite androgen prophylaxis
- HAE attack triggers may include minor trauma (such as dental procedures), oral contraceptives, and ACE inhibitors.
- Bowen T, Cicardi M, Farkas, H., et al. recommend plasma-derived C1 inhibitors for short-term prophylaxis: 10 to 20 units per kg one dose 1 hour before surgery or less than 6 hours before procedures (must be given before endotracheal intubation/manipulations) with a second dose of equal amount available during surgery.

V. Dosage and Administration

Drug Name	Indication	Dosing Regimen	Maximum Dose
human C1 esterase inhibitor (Berinert)	Treatment of acute HAE attacks	20 IU/kg body weight IV	Based on weight
human C1 esterase inhibitor (Haegarda)	Prophylaxis against HAE attacks	60 IU/kg body weight SC twice weekly (every 3 or 4 days)	Based on weight
human C1 esterase inhibitor (Cinryze)	Prophylaxis against HAE attacks	1000 units IV every 3-4 days	2500 units (not exceeding 100 units/kg) every 3-4 days
recombinant C1 esterase inhibitor (Ruconest)	Treatment of acute HAE attacks	< 84 kg: 50 units/kg IV ≥ 84 kg: 4200 units IV	4200 units/dose; up to 2 doses within a 24 hour period

Drug Name	Indication	Dosing Regimen	Maximum Dose
		May administer a second dose if symptoms persist	

VI. Product Availability

Drug Name	Availability
human C1 esterase inhibitor (Berinert)	Vial with powder for reconstitution: 500 IU
human C1 esterase inhibitor (Haegarda)	Vial with powder for reconstitution: 2000 IU, 3000 IU
human C1 esterase inhibitor (Cinryze)	Vial with powder for reconstitution: 500 units
recombinant C1 esterase inhibitor (Ruconest)	Vial with powder for reconstitution: 2100 units

VII. References

1. Berinert Prescribing Information. Marburg, Germany: CSL Behring GmbH; September 2016. Available at: www.berinert.com. Accessed November 15, 2017.
2. Cinryze Prescribing Information. Lexington, MA: Shire ViroPharma, Inc.; December 2016. Available at: www.cinryze.com. Accessed November 15, 2017.
3. Ruconest Prescribing Information. Raleigh, NC: Santarus Inc.; February 2015. Available at: www.ruconest.com. Accessed November 15, 2017.
4. Haegarda Prescribing Information. Kankakee, IL: CSL Behring LLC; July 2017. Available at: www.haegarda.com. Accessed November 15, 2017.
5. Danocrine Prescribing Information. Bridgewater, NJ: Sanofi-Aventis U.S. LLC.; December 2011. Available at: https://www.accessdata.fda.gov/drugsatfda_docs/label/2011/017557s033s039s040s041s0421bl.pdf. Accessed November 16, 2017.
6. Bowen T, Cicardi M, Farkas H, et al. Canadian 2003 International Consensus Algorithm For the Diagnosis, Therapy, and Management of Hereditary Angioedema. *J Allergy Clin Immunol*. 2004 Sep;114(3):629-37
7. Cicardi M, Bork K, Caballero T, et al. Evidence-based recommendations for the therapeutic management of angioedema owing to hereditary C1 inhibitor deficiency: consensus report of an International Working Group. *Allergy*. 2012; 67(2): 147-157.
8. Cicardi M, Aberer W, Banerji A, et al. Classification, diagnosis, and approach to treatment for angioedema: consensus report from the Hereditary Angioedema International Working Group. *Allergy*. 2014; 69(5): 602-616.
9. Craig T, Pursun E, Bork K, et al. WAO guideline for the management of hereditary angioedema. *WAO Journal*. 2012; 5: 182-199.
10. Zuraw BL, Banerji A, Bernstein JA, et al. US Hereditary Association Medical Advisory Board 2013 recommendations for the management of hereditary angioedema due to C1 inhibitor deficiency. *J Allergy Clin Immunol*. 2013; 1(5): 458-467.
11. Zuraw BL, Bernstein JA, Lang DM, et al. A focused parameter update: hereditary angioedema, acquired C1 inhibitor deficiency, and angiotensin-converting enzyme inhibitor-associated angioedema. *J Allergy Clin Immunol*. 2013; 131(6): 1491-1493.

Coding Implications

Codes referenced in this clinical policy are for informational purposes only. Inclusion or exclusion of any codes does not guarantee coverage. Providers should reference the most up-to-date sources of professional coding guidance prior to the submission of claims for reimbursement of covered services.

HCPCS Codes	Description
J0597	Injection, C-1 esterase inhibitor (human), Berinert, 10 units
J0598	Injection, C-1 esterase inhibitor (human), Cinryze, 10 units
J0596	Injection, C-1 esterase inhibitor (recombinant), Ruconest, 10 units

Reviews, Revisions, and Approvals	Date	P&T Approval Date
Medicaid: Policy converted to new template and split from CP.PHAR.46.HAE Treatment. Criteria: added dosing/max dose criteria per PIs; increased approval from one dose to up to two doses in 24 hours for Berinert.	02.16	03.16
Medicaid: Age changed from ≥ 13 to ≥ 12 , per the FDA definition of adolescent.	05.16	
Medicaid: Added criteria to confirm diagnosis. Removed age requirement. Increased approval duration to 12 months for Berinert/Ruconest and incorporated recommended dosing from PI. Added criteria for continued approval. Removed warnings against hypersensitivity reactions. For Cinryze, modified initial approval duration for long-term prophylaxis to 6 months and for renewal to 12 months. For continued therapy, added max dose criteria and reasons to discontinue.	02.17	03.17
1Q18 annual review: Policies combined for commercial and Medicaid. - Added Haegarda into the policy. - Medicaid: added specialist requirement, removed “Other types of angioedema have been ruled out” from part of diagnosis due to its subjective nature, while specialist has been added; removed qualifying descriptions of “abdominal, facial, or laryngeal attacks” for Berinert as there is no evidence that there is lack of efficacy in other forms of HAE; added short-term prophylaxis for plasma-derived C1 esterase inhibitors according to AOW treatment guidelines. - References reviewed and updated.	11.15.17	02.18

Important Reminder

This clinical policy has been developed by appropriately experienced and licensed health care professionals based on a review and consideration of currently available generally accepted standards of medical practice; peer-reviewed medical literature; government agency/program approval status; evidence-based guidelines and positions of leading national health professional organizations; views of physicians practicing in relevant clinical areas affected by this clinical policy; and other available clinical information. The Health Plan makes no representations and accepts no liability with respect to the content of any external information used or relied upon in developing this clinical policy. This clinical policy is consistent with standards of medical practice current at the time that this clinical policy was approved. “Health Plan” means a health plan that has adopted this clinical policy and that is operated or administered, in whole or in part, by Centene Management Company, LLC, or any of such health plan’s affiliates, as applicable.

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Note:

For Medicaid members, when state Medicaid coverage provisions conflict with the coverage provisions in this clinical policy, state Medicaid coverage provisions take precedence. Please refer to the state Medicaid manual for any coverage provisions pertaining to this clinical policy.

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