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

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 (which may include office chart notes and lab results) 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.

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Dosing Regimen</th>
<th>Dose Limit/ Maximum Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>danazol (Danocrine®)</td>
<td><strong>Long-term prophylaxis in adults:</strong> 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.</td>
<td>Adults: 800 mg/day</td>
</tr>
</tbody>
</table>

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 I 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.

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

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

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

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>human C1 esterase inhibitor (Berinert)</td>
<td>Vial with powder for reconstitution: 500 IU</td>
</tr>
<tr>
<td>human C1 esterase inhibitor (Haegarda)</td>
<td>Vial with powder for reconstitution: 2000 IU, 3000 IU</td>
</tr>
<tr>
<td>human C1 esterase inhibitor (Cinryze)</td>
<td>Vial with powder for reconstitution: 500 units</td>
</tr>
<tr>
<td>recombinant C1 esterase inhibitor (Ruconest)</td>
<td>Vial with powder for reconstitution: 2100 units</td>
</tr>
</tbody>
</table>

VII. References

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.

<table>
<thead>
<tr>
<th>HCPCS Codes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J0597</td>
<td>Injection, C-1 esterase inhibitor (human), Berinert, 10 units</td>
</tr>
<tr>
<td>J0598</td>
<td>Injection, C-1 esterase inhibitor (human), Cinryze, 10 units</td>
</tr>
<tr>
<td>J0596</td>
<td>Injection, C-1 esterase inhibitor (recombinant), Ruconest, 10 units</td>
</tr>
</tbody>
</table>

Reviews, Revisions, and Approvals

<table>
<thead>
<tr>
<th>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.</th>
<th>Date</th>
<th>P&amp;T Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>02.16</td>
<td>03.16</td>
</tr>
<tr>
<td>Medicaid: Age changed from ≥ 13 to ≥ 12, per the FDA definition of adolescent.</td>
<td>05.16</td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td>02.17</td>
<td>03.17</td>
</tr>
<tr>
<td>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.</td>
<td>11.15.17</td>
<td>02.18</td>
</tr>
</tbody>
</table>

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.

The purpose of this clinical policy is to provide a guide to medical necessity, which is a component of the guidelines used to assist in making coverage decisions and administering benefits. It does not constitute a contract or guarantee regarding payment or results. Coverage decisions and the administration of benefits are subject to all terms, conditions, exclusions and limitations of the coverage documents (e.g., evidence of coverage, certificate of coverage, policy, contract of insurance, etc.), as well as to state and federal requirements and applicable Health Plan-level administrative policies and procedures.

This clinical policy is effective as of the date determined by the Health Plan. The date of posting may not be the effective date of this clinical policy. This clinical policy may be subject to applicable legal and regulatory requirements relating to provider notification. If there is a discrepancy between the effective date of this clinical policy and any applicable legal or regulatory requirement, the requirements of law and regulation shall govern. The Health Plan retains the right to change, amend or withdraw this clinical policy, and additional clinical policies may be developed and adopted as needed, at any time.

This clinical policy does not constitute medical advice, medical treatment or medical care. It is not intended to dictate to providers how to practice medicine. Providers are expected to exercise professional medical judgment in providing the most appropriate care, and are solely responsible for the medical advice and treatment of members. This clinical policy is not intended to recommend treatment for members. Members should consult with their treating physician in connection with diagnosis and treatment decisions.

Providers referred to in this clinical policy are independent contractors who exercise independent judgment and over whom the Health Plan has no control or right of control. Providers are not agents or employees of the Health Plan.

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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.