

# FINAL DRAFT - LOGO Clinical UM Guideline

**Subject:** Chelation Therapy

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#### **Description**

This document addresses the uses of chelation therapy. Chelation therapy uses naturally occurring or chemically designed molecules to reduce potentially dangerous levels of heavy metals within the body. Chelation therapy is routinely performed for cases of iron overload, lead poisoning, copper toxicity, and other heavy metal conditions. This document is not applicable to agents used for the treatment of drug overdose or toxicities.

#### **Clinical Indications**

#### **Medically Necessary:**

Chelation therapy is considered medically necessary treatment for individuals with relevant clinical findings suggestive of heavy metal toxicity and a probable exposure history in any of the following conditions when confirmed by laboratory testing\*:

- 1. <u>Individuals with disorders of iron metabolism (for example, primary or secondary hemochromatosis)</u>; or
- 2. Lead overload in cases of acute or long-term lead exposure; or
- 3. Individuals with disorders of copper metabolism (for example, Wilson's disease); or

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- 4. Arsenic, mercury, iron, copper, or gold poisoning when long-term exposure and toxicity has been confirmed; or
- 5. Aluminum overload in individuals on chronic hemodialysis.

\*Note: Laboratory testing to confirm heavy metal toxicity should include blood or plasma specimens. In the case of suspected arsenic or mercury toxicity, it may be more appropriate to confirm diagnosis through a non-challenged urinalysis.

#### **Investigational and Not Medically Necessary:**

<u>Chelation therapy is considered investigational and not medically necessary for the treatment of all other conditions, including but not limited to, when the medically necessary criteria above have not been met.</u>

- 1. Heavy metal toxicity diagnosed via provoked urine testing;
- 2. Alzheimer's disease;
- 3. Autism Spectrum Disorders (ASD);
- 4. <u>Cadmium exposure</u>;
- 5. Cardiovascular disease (prevention and treatment);
- 6. Chronic fatigue syndrome;
- 7. Symptoms thought to be secondary to dental amalgam therapy;
- 8. Parkinson's disease;
- 9. Peripheral vascular disease:
- 10. Rheumatoid arthritis.

#### **Coding**

The following codes for treatments and procedures applicable to this guideline are included below for informational purposes. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement policy. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

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#### When services may be Medically Necessary when criteria are met:

HCPCSJ0470Injection, dimercaprol, per 100 mg [BAL in oil]J0600Injection, edetate calcium disodium up to 1,000 mg

J0895 <u>Injection, deferoxamine mesylate, 500 mg [Desferal]</u>

<u>J3520</u> <u>Edetate disodium, per 150 mg</u>

M0300 IV chelation therapy

S9355 Home infusion therapy, chelation therapy; administrative services, care

coordination, and all necessary supplies and equipment, per diem

**ICD-10 Diagnosis** 

D56.0-D56.9 Thalassemia

<u>D57.00-D57.819</u> <u>Sickle-cell disorders</u>

D61.01-D61.9 Other aplastic anemias and other bone marrow failure syndromes

<u>D64.0-D64.3</u> <u>Sideroblastic anemias (hereditary, secondary, other)</u>

E83.00-E83.09 Disorders of copper metabolism [includes Wilson's disease]
E83.10-E83.19 Disorders of iron metabolism [includes hemochromatosis]

N18.6 End stage renal disease

T45.4X1S Poisoning by iron and its compounds, accidental (unintentional); sequela

Poisoning by iron and its compounds, intentional self-harm; sequela

T45.4X3S Poisoning by iron and its compounds, assault; sequela

T45.4X4S Poisoning by iron and its compounds, undetermined; sequela

T45.4X5S Adverse effect of iron and its compounds, sequela

T56.0X1A-T56.0X4S Toxic effect of lead and its compounds

T56.1X1S Toxic effect of mercury and its compounds, accidental (unintentional); sequela
Toxic effect of mercury and its compounds, intentional self-harm; sequela

Toxic effect of mercury and its compounds, assault; sequela

T56.1X4S Toxic effect of mercury and its compounds, undetermined; sequela

T56.4X1S Toxic effect of copper and its compounds, accidental (unintentional); sequela

Toxic effect of copper and its compounds, intentional self-harm; sequela

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T56.4X3S	Toxic effect of copper and its compounds, assault; sequela
T56.4X4S	Toxic effect of copper and its compounds, undetermined; sequela
<b>T56.891S</b>	Toxic effect of other metals, accidental (unintentional); sequela [gold]
<b>T56.892S</b>	Toxic effect of other metals, intentional self-harm; sequela [gold]
T56.893S	Toxic effect of other metals, assault; sequela [gold]
T56.894S	Toxic effect of other metals, undetermined; sequela [gold]
T57.0X1S	Toxic effect of arsenic and its compounds, accidental (unintentional); sequela
T57.0X2S	Toxic effect of arsenic and its compounds, intentional self-harm; sequela
T57.0X3S	Toxic effect of arsenic and its compounds, assault; sequela
T57.0X4S	Toxic effect of arsenic and its compounds, undetermined; sequela
<b>Z77.010</b>	Contact with and (suspected) exposure to arsenic
<b>Z77.011</b>	Contact with and (suspected) exposure to lead
<b>Z99.2</b>	Dependence on renal dialysis

When services are **Investigational and** Not Medically Necessary:

For the procedure and diagnosis codes listed above when criteria are not met or for all other diagnoses not listed; or when the code describes a procedure designated in the Clinical Indications Position Statement section as investigational and not medically necessary.

#### **Discussion/General Information**

Chelation therapy involves the administration of drugs that bind heavy metal ions such as lead, arsenic, iron, and mercury in the blood stream preventing their interaction with vital organs, such as the brain and kidneys. Drugs used in the administration of chelation therapy are known as chelating agents. The abnormal presence of metals in the blood stream can be the result of environmental exposure, including ingestion of contaminated water and food or inhalation of tainted air. One common cause of lead exposure is in older buildings (built before 1978) in which lead based-paints have been used and not abated. Occupational exposure may occur in industrial processes such as ore smelting and mining, as well as chemical production. Some medical conditions may result in the accumulation of iron in the blood, leading to health problems. Chelation therapy reduces the accumulation of essential heavy metals, such as iron and copper or

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nonessential metals, such as lead and aluminum. Once the chelation agent has bound with metal ion the combined substance is more easily excreted by the body through the urinary and GI systems. Specific chelating agents are used to bind specific heavy metals.

Chelation therapy has been proposed as a treatment for the removal of heavy metal ions to reduce cellular oxidative damage caused by the production of hydroxyl radicals. This therapy is under investigation for the treatment of numerous non-overload conditions including, but not limited to, cardiovascular disease, reperfusion injury during coronary angioplasty or cardiopulmonary bypass surgery, anthracycline-associated cardiac damage, Alzheimer's disease, Parkinson's disease, autism spectrum disorders (ASD), and rheumatoid arthritis.

Chelation agents, however, also have potential toxicity. Chelation agents have been known to bind elements in the body which are necessary for regular functioning, including zinc and calcium. Large doses of vitamins usually accompany the use of chelation agents to lessen these types of side effects. When there is life threatening heavy metal toxicity necessitating treatment with high doses of chelating agents, treatment in the hospital may be needed to monitor for possible side effects. Under less urgent circumstances, chelating agents may be administered on an outpatient basis.

Chelation therapy has been well established to provide substantial clinical benefit for conditions where heavy metal overload has been accurately diagnosed (Angelucci, 2020; Botzenhardt, 2017; Cid, 2014; Delforge, 2014; Franchini, 2000; Guha Mazumder, 2001; Liu, 2020; Maggio, 2020 Mainous, 2014; Rogan, 2001; Shimizu, 1999; Waters, 2001; Yang, 2019; Zeidan, 2019). The diagnostic workup must consider the individual's history, an appropriate choice of testing methods, and the use of accurate and specific reference values (NCCN, 2021). With specific regard to urine testing, the diagnosis and use of chelation therapy should not be performed based on post-challenge urine testing. In post-challenge or post-provoked urine testing, the individual is first given a chelating agent followed by urine testing for heavy metals. The American College of Medical Toxicology (ACMT), in their 2009 position statement on the use of "Post-Chelator Challenge Metal Urine Testing," states that "Scientific investigation to date has failed to establish a valid correlation between prior metal exposure and post-challenge test values" and that post-challenge urine testing is being conducted without needed reference values. The ACMT further states the following:

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It is therefore, the position of the American College of Medical Toxicology that postchallenge urinary metal testing has not been scientifically validated, has no demonstrated benefit, and may be harmful when applied in the assessment and treatment of patients in whom there is concern for metal poisoning.

With appropriate heavy metal toxicity diagnosis, several studies published in the peer-reviewed medical literature have established that chelation therapy can be useful in binding toxic metal ions and facilitating their excretion through the liver or kidneys, and mitigating the morbidity associated with heavy metal toxicity such as end organ damage and impaired neurologic functioning.

Although chelation therapy has been investigated as a treatment of a wide variety of diseases and conditions, including Alzheimer's disease (Sampson, 2014), Parkinson's (Devos, 2014), autism spectrum disorders (James, 2015), and diabetes (Escolar, 2014), there has not been adequate scientific evidence to demonstrate the clinical utility of such methods, and use of chelation therapy is not considered in accordance with generally accepted standards of medical practice. A meta-analysis by Ng and colleagues (2007) evaluated chronic mercury exposure in children and adolescents. The authors concluded that there was "no evidence to support the association between mercury poisoning and autism" and "there is a lack of data in the literature about the effect of chelation therapy in children with neuro-developmental disabilities." The causal role of heavy metal overload in these conditions still needed to be ascertained, followed by studies demonstrating the clinical benefit of chelation therapy.

Dental amalgams have been investigated as a cause of increased blood levels of mercury, potentially associated with a number of diseases and disorders such as chronic fatigue syndrome and Alzheimer's disease. In 2009, the American Dental Association's (ADA) Council on Scientific Affairs reviewed the scientific literature on amalgam and stated: "The scientific evidence supports the position that amalgam is a valuable, viable and safe choice for dental patients." The Journal of the American Dental Association (JADA) reported that researchers found "no significant association of Alzheimer's Disease with the number, surface area or history of having dental amalgam restorations" and "no statistically significant differences in brain mercury levels between subjects with Alzheimer's disease and control subjects." The ADA's position

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has been reaffirmed by the U.S. FDA Center for Devices and Radiological Health in 2002, 2006 and 2009. The ADA's 2010 amalgam safety update cites that "studies continue to support the position that dental amalgam is a safe restorative option for both children and adults."

Chelation therapy has been proposed as a treatment of coronary artery disease (CAD), based in part on the hypothesis that chelation could remove atherosclerotic calcium deposits or provide an antioxidant benefit (Dans, 2003; Lamas, 2013, 2014). One small placebo-controlled randomized study of 84 individuals with atherosclerotic heart disease did not report any advantage of chelation therapy, as measured by time to ischemia, at 27 weeks of follow-up (Anderson, 2003; Knudtson, 2002). The use of chelation therapy in lieu of established therapies, the lack of adequate prior research to verify its effectiveness and clinical utility, and the overall impact of CAD prompted the National Center for Complementary and Alternative Medicine (NCCAM) and the National Heart, Lung, and Blood Institute (NHLBI) to sponsor a large-scale clinical study. The 5-year Trial to Assess Chelation Therapy (TACT) in CAD began recruiting individuals in March of 2003. This multicenter, randomized, double-blind study enrolled more than 1600 participants aged 50 or older who had a history of heart attack. The study tested whether chelation therapy or high-dose vitamin therapy are effective for the treatment of CAD. The primary study endpoint of this trial was a composite of heart attack, stroke, hospitalization for angina, coronary revascularization, and death. The study also evaluated cardiac deaths, nonfatal heart attacks, health-related quality of life (HR-QOL), and cost effectiveness, among other factors. Final results indicated that among stable individuals with a history of heart attack, an intravenous chelation regimen with disodium ethylenediaminetetraacetic acid (EDTA), when compared with placebo, modestly reduced the risk of negative cardiovascular outcomes, particularly revascularization procedures. Study authors emphasized that these results are insufficient to support the routine use of chelation therapy for treatment of individuals who have previously suffered from a heart attack.

#### **Definitions**

<u>Autism Spectrum Disorder (ASD): A collection of associated developmental disorders that affect the parts of</u> the brain associated with social interaction and verbal and non-verbal communication.

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<u>Primary hemochromatosis: A rare genetic disease that results in the overabundance of iron in the liver, brain, heart, and kidneys, causing liver dysfunction, diabetes, changes in skin pigmentation, heart problems, arthritis, and testicular atrophy.</u>

<u>Secondary hemochromatosis</u>: A type of hemochromatosis which is usually the result of another condition or disease that causes the overabundance of iron. This disease and condition may include anemias, chronic liver diseases, and the requirement of blood transfusions.

Sickle cell disease: An inherited genetic disorder that causes red blood cells to take on a characteristic crescent or sickle-like shape with decreased ability to carry oxygen.

Sideroblastic anemia: A condition in which there is excess iron in the bone cells.

Thalassemia intermedia: A genetic form of anemia in which there is an abnormality in the oxygen carrying portion of red blood cells.

Wilson's disease: An inherited (autosomal recessive) disorder where excessive quantities of copper build up in the body, particularly in the liver and central nervous system.

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#### **Government Agency, Medical Society, and Other Authoritative Publications:**

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  - National Coverage Determination: Chelation Therapy for Treatment of Atherosclerosis. NCD #20.21. Effective date not posted
  - National Coverage Determination: Ethylenediamine-Tetra-Acetic (EDTA) Chelation Therapy for Treatment of Atherosclerosis. NCD #20.22. Effective date not posted
- 5. <u>Dans AL, Tan FN, Villarruz-Sulit EC. Chelation therapy for atherosclerotic cardiovascular disease.</u> Cochrane Database Syst Rev. 2002;(4):CD002785.

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- 13. <u>Villarruz-Sulit MV, Forster R, Dans AL, Tan FN, Sulit DV. Chelation therapy for atherosclerotic cardiovascular disease. Cochrane Database Syst Rev. 2020; (5):CD002785.</u>

#### **Websites for Additional Information**

- 1. National Institutes of Health:
  - a. National Heart, Lung, and Blood Institute (NHLBI). Disease and Conditions Index, Blood Diseases. What are Thalassemias? Updated on March 24, 2022, 2016. Available at: http://www.nhlbi.nih.gov/health/health-topics/topics/thalassemia. Accessed on April 29, 2022.
  - b. <u>National Center for Complementary and Integrative Health (NCCIH). Chelation for Coronary Heart Disease. Updated on January 2020. Available at: https://nccih.nih.gov/health/chelation.</u>
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- 2. U.S. Food and Drug Administration Center for Devices and Radiological Health (CDRH). CDRH consumer information. Dental amalgams. Updated February 2, 2021. Rockville, MD: FDA. Available at: <a href="http://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/DentalProducts/DentalAmalgam/default.htm">http://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/DentalProducts/DentalAmalgam/default.htm</a>. Accessed on April 29, 2022.

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<u>Autism</u>

BAL

Calcium disodium Versenate®

**Calcium EDTA** 

CaNa2-EDTA

Cooley's anemia

**Deferoxamine mesylate** 

**Desferal**®

**Desferrioxamine** 

**Dimercaprol** 

**DMSA** 

Edathamil calcium disodium

**Edathamil disodium** 

Edetate calcium disodium

Hemochromatosis

**Pervasive Development Disorders** 

Sodium calcium EDTA

Wilson's Disease

The use of specific product names is illustrative only. It is not intended to be a recommendation of one product over another, and is not intended to represent a complete listing of all products available.

#### **History**

Status <u>Date</u> <u>Action</u>

New 05/12/2022 Medical Policy & Technology Assessment Committee (MPTAC) review.

Initial document development. Moved content of MED.00127 Chelation

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Therapy to new clinical utilization management guideline document with the same title.



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