MASSACHUSETTS

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Medical Policy
Chelation Therapy

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Policy Number: 122

BCBSA Reference Number: 8.01.02
NCD/LCD: N/A

Related Policies

None

Policy

Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity Medicare HMO Blue℠ and Medicare PPO Blue℠ Members

Chelation therapy in the treatment of the following conditions is **MEDICALLY NECESSARY**:

- Extreme conditions of metal toxicity
- Treatment of chronic iron overload due to blood transfusions (transfusional hemosiderosis) or due to nontransfusion-dependent thalassemia (NTDT)
- Wilson's disease (hepatolenticular degeneration), or
- Lead poisoning.

Chelation therapy in the treatment of the following conditions is **MEDICALLY NECESSARY** if other modalities have failed:

- Control of ventricular arrhythmias or heart block associated with digitalis toxicity
- Emergency treatment of hypercalcemia.

NaEDTA as chelation therapy is considered **NOT MEDICALLY NECESSARY**.

Off-label applications of chelation therapy are considered **INVESTIGATIONAL**, including, but not limited to:

- Alzheimer’s disease
- Arthritis (includes rheumatoid arthritis)
- Atherosclerosis, (e.g., coronary artery disease, secondary prevention in patients with myocardial infarction, or peripheral vascular disease)
- Autism
- Diabetes
- Multiple sclerosis.

Prior Authorization Information

Inpatient

- For services described in this policy, precertification/preauthorization **IS REQUIRED** for all products if the procedure is performed **inpatient**.

Outpatient

- For services described in this policy, see below for products where prior authorization **might be required** if the procedure is performed **outpatient**.

	Outpatient
Commercial Managed Care (HMO and POS)	Prior authorization is **not required**.
Commercial PPO and Indemnity	Prior authorization is **not required**.
Medicare HMO Blue℠	Prior authorization is **not required**.
Medicare PPO Blue℠	Prior authorization is **not required**.

CPT Codes / HCPCS Codes / ICD Codes

Inclusion or exclusion of a code does not constitute or imply member coverage or provider reimbursement. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage as it applies to an individual member.

Providers should report all services using the most up-to-date industry-standard procedure, revenue, and diagnosis codes, including modifiers where applicable.

The following codes are included below for informational purposes only; this is not an all-inclusive list.

The above medical necessity criteria MUST be met for the following codes to be covered for Commercial Members: Managed Care (HMO and POS), PPO, Indemnity, Medicare HMO Blue and Medicare PPO Blue:

HCPCS Codes

HCPCS codes:	Code Description
J0470	Injection, dimercaprol, per 100 mg
J0600	Injection, edetate calcium disodium, up to 1,000 mg
J0895	Injection, deferoxamine mesylate, [Desferal] 500 mg
J3520	Edetate disodium, per 150 mg
S9355	Home infusion therapy, chelation therapy; administrative services, professional pharmacy services, care coordination, and all necessary supplies and equipment (drugs and nursing visits coded separately), per diem

The following ICD Diagnosis Codes are considered medically necessary when submitted with the HCPCS codes above if medical necessity criteria are met:

ICD-10 Diagnosis Codes

ICD-10-CM Diagnosis codes:	Code Description
D56.0	Alpha thalassemia
D56.1	Beta thalassemia
D56.5	Hemoglobin E-beta thalassemia
E83.00	Disorder of copper metabolism, unspecified
E83.01	Wilson's disease
E83.09	Other disorders of copper metabolism
E83.111	Hemochromatosis due to repeated red blood cell transfusions

E83.52	Hypercalcemia
I44.0	Atrioventricular block, first degree
I44.1	Atrioventricular block, second degree
I44.2	Atrioventricular block, complete
I44.30	Unspecified atrioventricular block
I44.39	Other atrioventricular block
I44.4	Left anterior fascicular block
I44.5	Left posterior fascicular block
I44.60	Unspecified fascicular block
I44.69	Other fascicular block
I44.7	Left bundle-branch block, unspecified
I45.0	Right fascicular block
I45.10	Unspecified right bundle-branch block
I45.19	Other right bundle-branch block
I45.2	Bifascicular block
I45.3	Trifascicular block
I45.4	Nonspecific intraventricular block
I45.5	Other specified heart block
I49.8	Other specified cardiac arrhythmias
M1A.10x0	Lead-induced chronic gout, unspecified site, without tophus (tophi)
M1A.10x1	Lead-induced chronic gout, unspecified site, with tophus (tophi)
M1A.1110	Lead-induced chronic gout, right shoulder, without tophus (tophi)
M1A.1111	Lead-induced chronic gout, right shoulder, with tophus (tophi)
M1A.1120	Lead-induced chronic gout, left shoulder, without tophus (tophi)
M1A.1121	Lead-induced chronic gout, left shoulder, with tophus (tophi)
M1A.1190	Lead-induced chronic gout, unspecified shoulder, without tophus (tophi)
M1A.1191	Lead-induced chronic gout, unspecified shoulder, with tophus (tophi)
M1A.1210	Lead-induced chronic gout, right elbow, without tophus (tophi)
M1A.1211	Lead-induced chronic gout, right elbow, with tophus (tophi)
M1A.1220	Lead-induced chronic gout, left elbow, without tophus (tophi)
M1A.1221	Lead-induced chronic gout, left elbow, with tophus (tophi)
M1A.1290	Lead-induced chronic gout, unspecified elbow, without tophus (tophi)
M1A.1291	Lead-induced chronic gout, unspecified elbow, with tophus (tophi)
M1A.1310	Lead-induced chronic gout, right wrist, without tophus (tophi)
M1A.1311	Lead-induced chronic gout, right wrist, with tophus (tophi)
M1A.1320	Lead-induced chronic gout, left wrist, without tophus (tophi)
M1A.1321	Lead-induced chronic gout, left wrist, with tophus (tophi)
M1A.1390	Lead-induced chronic gout, unspecified wrist, without tophus (tophi)
M1A.1391	Lead-induced chronic gout, unspecified wrist, with tophus (tophi)
M1A.1410	Lead-induced chronic gout, right hand, without tophus (tophi)
M1A.1411	Lead-induced chronic gout, right hand, with tophus (tophi)
M1A.1420	Lead-induced chronic gout, left hand, without tophus (tophi)
M1A.1421	Lead-induced chronic gout, left hand, with tophus (tophi)
M1A.1490	Lead-induced chronic gout, unspecified hand, without tophus (tophi)
M1A.1491	Lead-induced chronic gout, unspecified hand, with tophus (tophi)
M1A.1510	Lead-induced chronic gout, right hip, without tophus (tophi)
M1A.1511	Lead-induced chronic gout, right hip, with tophus (tophi)
M1A.1520	Lead-induced chronic gout, left hip, without tophus (tophi)
M1A.1521	Lead-induced chronic gout, left hip, with tophus (tophi)
M1A.1590	Lead-induced chronic gout, unspecified hip, without tophus (tophi)
M1A.1591	Lead-induced chronic gout, unspecified hip, with tophus (tophi)

M1A.1610	Lead-induced chronic gout, right knee, without tophus (tophi)
M1A.1611	Lead-induced chronic gout, right knee, with tophus (tophi)
M1A.1620	Lead-induced chronic gout, left knee, without tophus (tophi)
M1A.1621	Lead-induced chronic gout, left knee, with tophus (tophi)
M1A.1690	Lead-induced chronic gout, unspecified knee, without tophus (tophi)
M1A.1691	Lead-induced chronic gout, unspecified knee, with tophus (tophi)
M1A.1710	Lead-induced chronic gout, right ankle and foot, without tophus (tophi)
M1A.1711	Lead-induced chronic gout, right ankle and foot, with tophus (tophi)
M1A.1720	Lead-induced chronic gout, left ankle and foot, without tophus (tophi)
M1A.1721	Lead-induced chronic gout, left ankle and foot, with tophus (tophi)
M1A.1790	Lead-induced chronic gout, unspecified ankle and foot, without tophus (tophi)
M1A.1791	Lead-induced chronic gout, unspecified ankle and foot, with tophus (tophi)
M1A.18x0	Lead-induced chronic gout, vertebrae, without tophus (tophi)
M1A.18x1	Lead-induced chronic gout, vertebrae, with tophus (tophi)
M1A.19x0	Lead-induced chronic gout, multiple sites, without tophus (tophi)
M1A.19x1	Lead-induced chronic gout, multiple sites, with tophus (tophi)
Q24.6	Congenital heart block
R00.1	Bradycardia, unspecified
T46.0x1A	Poisoning by cardiac-stimulant glycosides and drugs of similar action, accidental (unintentional), initial encounter
T46.0x1D	Poisoning by cardiac-stimulant glycosides and drugs of similar action, accidental (unintentional), subsequent encounter
T46.0x2A	Poisoning by cardiac-stimulant glycosides and drugs of similar action, intentional self-harm, initial encounter
T46.0x2D	Poisoning by cardiac-stimulant glycosides and drugs of similar action, intentional self-harm, subsequent encounter
T46.0x2S	Poisoning by cardiac-stimulant glycosides and drugs of similar action, intentional self-harm, sequela
T46.0x3A	Poisoning by cardiac-stimulant glycosides and drugs of similar action, assault, initial encounter
T46.0x3D	Poisoning by cardiac-stimulant glycosides and drugs of similar action, assault, subsequent encounter
T46.0x3S	Poisoning by cardiac-stimulant glycosides and drugs of similar action, assault, sequela
T46.0x4A	Poisoning by cardiac-stimulant glycosides and drugs of similar action, undetermined, initial encounter
T46.0x4D	Poisoning by cardiac-stimulant glycosides and drugs of similar action, undetermined, subsequent encounter
T46.0x4S	Poisoning by cardiac-stimulant glycosides and drugs of similar action, undetermined, sequela
T46.0x5A	Adverse effect of cardiac-stimulant glycosides and drugs of similar action, initial encounter
T46.0x5D	Adverse effect of cardiac-stimulant glycosides and drugs of similar action, subsequent encounter
T46.0x5S	Adverse effect of cardiac-stimulant glycosides and drugs of similar action, sequela
T56.0x1A	Toxic effect of lead and its compounds, accidental (unintentional), initial encounter
T56.0x2A	Toxic effect of lead and its compounds, intentional self-harm, initial encounter
T56.0x3A	Toxic effect of lead and its compounds, assault, initial encounter
T56.0x4A	Toxic effect of lead and its compounds, undetermined, initial encounter
T56.4x1A	Toxic effect of copper and its compounds, accidental (unintentional), initial encounter
T56.4x2A	Toxic effect of copper and its compounds, intentional self-harm, initial encounter
T56.4x3A	Toxic effect of copper and its compounds, assault, initial encounter
T56.4x4A	Toxic effect of copper and its compounds, undetermined, initial encounter

T56.5x1A	Toxic effect of zinc and its compounds, accidental (unintentional), initial encounter
T56.5x2A	Toxic effect of zinc and its compounds, intentional self-harm, initial encounter
T56.5x3A	Toxic effect of zinc and its compounds, assault, initial encounter
T56.5x4A	Toxic effect of zinc and its compounds, undetermined, initial encounter
T56.891A	Toxic effect of other metals, accidental (unintentional), initial encounter
T56.892A	Toxic effect of other metals, intentional self-harm, initial encounter
T56.893A	Toxic effect of other metals, assault, initial encounter
T56.894A	Toxic effect of other metals, undetermined, initial encounter

The following HCPCS code is considered investigational for Commercial Members: Managed Care (HMO and POS), PPO, Indemnity, Medicare HMO Blue and Medicare PPO Blue:

HCPCS Codes

HCPCS codes:	Code Description
M0300	IV chelation therapy (chemical endarterectomy)

Description

Chelation therapy is an established treatment for the removal of metal toxins by converting them to a chemically inert form that can be excreted in the urine. Chelation therapy comprises intravenous or oral administration of chelating agents that remove metal ions such as lead, aluminum, mercury, arsenic, zinc, iron, copper, and calcium from the body. Specific chelating agents are used for particular heavy metal toxicities. For example, desferrioxamine (not approved by the Food and Drug Administration [FDA]) is used for patients with iron toxicity, and calcium-ethylenediaminetetraacetic acid (EDTA) is used for patients with lead poisoning. (Disodium-EDTA is not recommended for acute lead poisoning due to the increased risk of death from hypocalcemia.1,)

Another class of chelating agents, called metal protein attenuating compounds (MPACs), is under investigation for the treatment of Alzheimer disease, which is associated with the disequilibrium of cerebral metals. Unlike traditional systemic chelators that bind and remove metals from tissues systemically, MPACs have subtle effects on metal homeostasis and abnormal metal interactions. In animal models of Alzheimer disease, they promote the solubilization and clearance of β-amyloid by binding its metal-ion complex and also inhibit redox reactions that generate neurotoxic free radicals. MPACs, therefore, interrupt 2 putative pathogenic processes of Alzheimer disease. However, no MPACs have received FDA approval for treating Alzheimer disease.

Chelation therapy also has been considered as a treatment for other indications, including atherosclerosis and autism spectrum disorder. For example, EDTA chelation therapy has been proposed in patients with atherosclerosis as a method of decreasing obstruction in the arteries.

Summary

Chelation therapy, an established treatment for heavy metal toxicities and transfusional hemosiderosis, has been investigated for a variety of off-label applications, such as treatment of atherosclerosis, Alzheimer disease, and autism. This evidence review does not address indications for chelation therapy approved by the U.S. Food and Drug Administration. Instead, it addresses off-label indications, including Alzheimer disease, cardiovascular disease, autism spectrum disorder, diabetes, multiple sclerosis, and arthritis.

For individuals who have Alzheimer disease, or cardiovascular disease, or autism spectrum disorder, or diabetes, or multiple sclerosis, or arthritis who receive chelation therapy, the evidence includes a small number of randomized controlled trials and case series. Relevant outcomes are symptoms, change in disease status, morbid events, functional outcomes, health status measures, quality of life, and treatment-related morbidity. One randomized controlled trial (the Trial to Assess Chelation Therapy) reported that chelation therapy reduced cardiovascular events in patients with previous myocardial infarction and that

the benefit was greater in diabetic patients compared with nondiabetic patients. However, this trial had significant limitations (eg, high dropout rates) and, therefore, conclusions are not definitive. For other conditions, the available randomized controlled trials did not report improvements in health outcomes with chelation therapy and, as evidence, the case series are inadequate to determine efficacy. The evidence is insufficient to determine the effect of the technology on health outcomes.

Policy History

Date	Action
4/1/2019	BCBSA National medical policy review. Description, summary and references updated. Policy statement(s) unchanged.
6/2018	BCBSA National medical policy review. Policy criteria clarified. 6/1/2018.
3/2018	New references added from BCBSA National medical policy. Background and summary clarified.
3/2017	New references added from BCBSA National medical policy.
11/2015	BCBSA National medical policy review. Hypoglycemia deleted from the policy statement. Clarified coding language. Effective 11/1/2015.
11/2014	BCBSA National medical policy review. Investigational indications clarified. Coding information clarified. Effective 11/1/2014.
6/2014	Updated Coding section with ICD10 procedure and diagnosis codes, effective 10/2015.
12/2013	BCBSA National medical policy review. New medically necessary and investigational indications described. Effective 12/1/2013.
11/2011-4/2012	Medical policy ICD 10 remediation: Formatting, editing and coding updates. No changes to policy statements.
4/2011	Reviewed - Medical Policy Group - Cardiology and Pulmonology. No changes to policy statements.
2/2011	Reviewed - Medical Policy Group - Psychiatry and Ophthalmology. No changes to policy statements.
1/2011	Reviewed - Medical Policy Group - Neurology and Neurosurgery. No changes to policy statements.
4/2010	Reviewed - Medical Policy Group - Cardiology. No changes to policy statements.
9/2009	Medical Policy122 describing covered and non-covered indications.

Information Pertaining to All Blue Cross Blue Shield Medical Policies

Click on any of the following terms to access the relevant information:
Medical Policy Terms of Use
Managed Care Guidelines
Indemnity/PPO Guidelines
Clinical Exception Process
Medical Technology Assessment Guidelines

References

1. Centers for Disease Control and Prevention. Deaths associated with hypocalcemia from chelation therapy--Texas, Pennsylvania, and Oregon, 2003-2005. MMWR Morb Mortal Wkly Rep. Mar 03 2006;55(8):204-207. PMID 16511441
2. Food and Drug Administration. Hospira, Inc., et al.; Withdrawal of Approval of One New Drug Application and Two Abbreviated New Drug Application. Federal Register. 2008;73(113):33440-33441. PMID
3. U.S Food and Drug Administration. FDA warns consumers about potential health risks from using Thorne Research's Captomer products. 2014 June 12; http://www.fda.gov/Drugs/DrugSafety/ucm400977.htm?source=govdelivery&utm_medium=email&utm_source=govdelivery. Accessed January 23, 2018.
4. Sampson E, Jenagaratnam L, McShane R. Metal protein attenuating compounds for the treatment of Alzheimer's disease. Cochrane Database Syst Rev. Jan 23 2008(1):CD005380. PMID 18254079

5. Ritchie CW, Bush AI, Mackinnon A, et al. Metal-protein attenuation with iodochlorhydroxyquin (clioquinol) targeting Abeta amyloid deposition and toxicity in Alzheimer disease: a pilot phase 2 clinical trial. Arch Neurol. Dec 2003;60(12):1685-1691. PMID 14676042
6. Sampson EL, Jenagaratnam L, McShane R. Metal protein attenuating compounds for the treatment of Alzheimer's dementia. Cochrane Database Syst Rev. May 16 2012;5(5):CD005380. PMID 22592705
7. Lannfelt L, Blennow K, Zetterberg H, et al. Safety, efficacy, and biomarker findings of PBT2 in targeting Abeta as a modifying therapy for Alzheimer's disease: a phase IIa, double-blind, randomised, placebo-controlled trial. Lancet Neurol. Sep 2008;7(9):779-786. PMID 18672400
8. Villarruz MV, Dans A, Tan F. Chelation therapy for atherosclerotic cardiovascular disease. Cochrane Database Syst Rev. Jan 2002(4):CD002785. PMID 12519577
9. Knudtson ML, Wyse DG, Galbraith PD, et al. Chelation therapy for ischemic heart disease: a randomized controlled trial. Jama. Jan 23-30 2002;287(4):481-486. PMID 11798370
10. Anderson TJ, Hubacek J, Wyse DG, et al. Effect of chelation therapy on endothelial function in patients with coronary artery disease: PATCH substudy. J Am Coll Cardiol. Feb 5 2003;41(3):420-425. PMID 12575969
11. Guldager B, Jelnes R, Jorgensen SJ, et al. EDTA treatment of intermittent claudication--a double-blind, placebo-controlled study. J Intern Med. Mar 1992;231(3):261-267. PMID 1556523
12. van Rij AM, Solomon C, Packer SG, et al. Chelation therapy for intermittent claudication. A double-blind, randomized, controlled trial. Circulation. Sep 1994;90(3):1194-1199. PMID 8087928
13. Lamas GA, Goertz C, Boineau R, et al. Effect of disodium EDTA chelation regimen on cardiovascular events in patients with previous myocardial infarction: the TACT randomized trial. Jama. Mar 27 2013;309(12):1241-1250. PMID 23532240
14. Mark DB, Anstrom KJ, Clapp-Channing NE, et al. Quality-of-life outcomes with a disodium EDTA chelation regimen for coronary disease: results from the trial to assess chelation therapy randomized trial. Circ Cardiovasc Qual Outcomes. Jul 2014;7(4):508-516. PMID 24987051
15. Lamas GA, Boineau R, Goertz C, et al. EDTA chelation therapy alone and in combination with oral high-dose multivitamins and minerals for coronary disease: The factorial group results of the Trial to Assess Chelation Therapy. Am Heart J. Jul 2014;168(1):37-44 e35. PMID 24952858
16. Nissen SE. Concerns about reliability in the Trial to Assess Chelation Therapy (TACT) [editorial]. Jama. Mar 27 2013;309(12):1293-1294. PMID 23532246
17. Maron DJ, Hlatky MA. Trial to Assess Chelation Therapy (TACT) and equipoise: When evidence conflicts with beliefs [editorial]. Am Heart J. Jul 2014;168(1):4-5. PMID 24952853
18. Bernard S, Enayati A, Redwood L, et al. Autism: a novel form of mercury poisoning. Med Hypotheses. Apr 2001;56(4):462-471. PMID 11339848
19. Nelson KB, Bauman ML. Thimerosal and autism? Pediatrics. Mar 2003;111(3):674-679. PMID 12612255
20. Ng DK, Chan CH, Soo MT, et al. Low-level chronic mercury exposure in children and adolescents: meta-analysis. Pediatr Int. Feb 2007;49(1):80-87. PMID 17250511
21. Rossignol DA. Novel and emerging treatments for autism spectrum disorders: a systematic review. Ann Clin Psychiatry. Oct-Dec 2009;21(4):213-236. PMID 19917212
22. Cooper GJ, Young AA, Gamble GD, et al. A copper(II)-selective chelator ameliorates left-ventricular hypertrophy in type 2 diabetic patients: a randomised placebo-controlled study. Diabetologia. Apr 2009;52(4):715-722. PMID 19172243
23. Escolar E, Lamas GA, Mark DB, et al. The effect of an EDTA-based chelation regimen on patients with diabetes mellitus and prior myocardial infarction in the Trial to Assess Chelation Therapy (TACT). Circ Cardiovasc Qual Outcomes. Jan 2014;7(1):15-24. PMID 24254885
24. Chen KH, Lin JL, Lin-Tan DT, et al. Effect of chelation therapy on progressive diabetic nephropathy in patients with type 2 diabetes and high-normal body lead burdens. Am J Kidney Dis. Oct 2012;60(4):530-538. PMID 22721929
25. U.S. Department of Labor, Occupational Health and Safety Adminstration. Safety and Health Regulations for Construction: Substance Data Sheet for Occupational Exposure to Lead. 1993; http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10642. Accessed January 23, 2018.
26. Weinreb O, Mandel S, Youdim MB, et al. Targeting dysregulation of brain iron homeostasis in Parkinson's disease by iron chelators. Free Radic Biol Med. Sep 2013;62:52-64. PMID 23376471

27. Grolez G, Moreau C, Sablonniere B, et al. Ceruloplasmin activity and iron chelation treatment of patients with Parkinson's disease. BMC Neurol. May 6 2015;15:74. PMID 25943368
28. van Eijk LT, Heemskerk S, van der Pluijm RW, et al. The effect of iron loading and iron chelation on the innate immune response and subclinical organ injury during human endotoxemia: a randomized trial. Haematologica. Mar 2014;99(3):579-587. PMID 24241495
29. Qaseem A, Fihn SD, Dallas P, et al. Management of stable ischemic heart disease: summary of a clinical practice guideline from the American College of Physicians/American College of Cardiology Foundation/American Heart Association/American Association for Thoracic Surgery/Preventive Cardiovascular Nurses Association/Society of Thoracic Surgeons. Ann Intern Med. Nov 20 2012;157(10):735-743. PMID 23165665
30. Fihn SD, Blankenship JC, Alexander KP, et al. 2014 ACC/AHA/AATS/PCNA/SCAI/STS focused update of the guideline for the diagnosis and management of patients with stable ischemic heart disease: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines, and the American Association for Thoracic Surgery, Preventive Cardiovascular Nurses Association, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. J Am Coll Cardiol. Nov 4 2014;64(18):1929-1949. PMID 25077860
31. Snow V, Barry P, Fihn SD, et al. Primary care management of chronic stable angina and asymptomatic suspected or known coronary artery disease: a clinical practice guideline from the American College of Physicians. Ann Intern Med. Oct 5 2004;141(7):562-567. PMID 15466774
32. Hirsch AT, Haskal ZJ, Hertzer NR, et al. ACC/AHA 2005 Practice Guidelines for the management of patients with peripheral arterial disease (lower extremity, renal, mesenteric, and abdominal aortic): a collaborative report from the American Association for Vascular Surgery/Society for Vascular Surgery, Society for Cardiovascular Angiography and Interventions, Society for Vascular Medicine and Biology, Society of Interventional Radiology, and the ACC/AHA Task Force on Practice Guidelines (Writing Committee to Develop Guidelines for the Management of Patients With Peripheral Arterial Disease): endorsed by the American Association of Cardiovascular and Pulmonary Rehabilitation; National Heart, Lung, and Blood Institute; Society for Vascular Nursing; TransAtlantic Inter-Society Consensus; and Vascular Disease Foundation. Circulation. Mar 21 2006;113(11):e463-654. PMID 16549646
33. 2011 ACCF/AHA Focused Update of the Guideline for the Management of patients with peripheral artery disease (Updating the 2005 Guideline): a report of the American College of Cardiology Foundation/American Heart Association Task Force on practice guidelines. Circulation. Nov 1 2011;124(18):2020-2045. PMID 21959305
34. Anderson JL, Halperin JL, Albert NM, et al. Management of patients with peripheral artery disease (compilation of 2005 and 2011 ACCF/AHA guideline recommendations): a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. Circulation. Apr 2 2013;127(13):1425-1443. PMID 23457117
35. Mancini GB, Gosselin G, Chow B, et al. Canadian Cardiovascular Society guidelines for the diagnosis and management of stable ischemic heart disease. Can J Cardiol. Aug 2014;30(8):837-849. PMID 25064578
36. National Institute for Health and Care Excellence. Autism spectrum disorder in under 19s: support and management [CG170]. 2013; https://www.nice.org.uk/guidance/cg170. Accessed January 23, 2018.
37. National Institute for Health and Care Excellence. Autism spectrum disorder in adults: diagnosis and management [CG142]. 2016; https://www.nice.org.uk/guidance/CG142. Accessed January 23, 2018.
38. Centers for Medicare & Medicaid Services (CMS). National Coverage Determination (NCD) for CHELATION THERAPY for Treatment of Atherosclerosis (20.21). n.d.; https://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?NCDId=86&ncdver=1&CoverageSelection=National&KeyWord=Chelation+Therapy&KeyWordLookUp=Title&KeyWordSearchType=And&bc=gAAAACAAAAAAAA%3d%3d&. Accessed January 23, 2018.
39. Centers for Medicare & Medicaid Services (CMS). National Coverage Determination (NCD) for Ethylenediamine-Tetra-Acetic (EDTA) CHELATION THERAPY for Treatment of Atherosclerosis (20.22). n.d.; https://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?NCDId=146&ncdver=1&CoverageSelection=National&KeyWord=Chelation+Therapy&Ke

yWordLookUp=Title&KeyWordSearchType=And&bc=gAAAACAAAAAAAA%3d%3d&. Accessed January 23, 2018.
40. Centers for Disease Control and Prevention (CDC). What Do Parents Need to Know to Protect Their Children? 2017, May 17; http://www.cdc.gov/nceh/lead/ACCLPP/blood_lead_levels.htm. Accessed January 23, 2018.
41. Very high blood lead levels among adults - United States, 2002-2011. MMWR Morb Mortal Wkly Rep. Nov 29 2013;62(47):967-971. PMID 24280917
42. Agency for Toxic Substances and Disease Registry. Toxicological profile for mercury. 1999 March; https://www.atsdr.cdc.gov/ToxProfiles/tp46.pdf. Accessed January 23, 2018.
43. Centers for Disease Control and Prevention (CDC). Emergency preparedness and response. Case definition: thallium. 2015 November 18; http://emergency.cdc.gov/agent/thallium/casedef.asp. Accessed January 23, 2018.
44. Adal A. Medscape. Heavy metal toxicity. 2018; http://emedicine.medscape.com/article/814960-overview. Accessed January 24, 2018.
45. Kempson IM, Lombi E. Hair analysis as a biomonitor for toxicology, disease and health status. Chem Soc Rev. Jul 2011;40(7):3915-3940. PMID 21468435