

# Corporate Medical Policy

## Chiropractic Services

**File Name:** chiropractic\_services  
**Origination:** 6/2000  
**Last Review:** 9/2023

### Description of Procedure or Service

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Chiropractic medicine is a science which is based on the relationship between the structure and function of the human body. Services rendered are intended to support the spinal column and nervous system functions.

The American Chiropractic Association published the following definitions: Chiropractic is a health care profession that focuses on disorders of the musculoskeletal system and the nervous system, and the effects of these disorders on general health. Chiropractic care is used most often to treat neuromusculoskeletal complaints, including but not limited to back pain, neck pain, pain in the joints of the arms or legs, and headaches. Spinal manipulations and other treatment modalities can be provided manually or with the assistance of mechanical or electrical devices.

Doctors of Chiropractic – often referred to as chiropractors or chiropractic physicians – practice a drug-free, hands-on approach to health care that includes patient examination, diagnosis and treatment. Chiropractors have broad diagnostic skills and are also trained to recommend therapeutic and rehabilitative exercises.... Chiropractors will readily refer patients to the appropriate health care provider when chiropractic care is not suitable for the patient’s condition, or the condition warrants co-management in conjunction with other members of the health care team.

**Supportive Care:** Supportive care is long-term treatment/care for patients who have reached maximum therapeutic benefit, but who fail to sustain benefit and progressively deteriorate when there are periodic trials of treatment withdrawal. Supportive care follows appropriate application of active and passive care including rehabilitation and/or lifestyle modifications. Supportive care is appropriate when alternative care options, including home-based self-care or referral, have been considered and/or attempted. Supportive care may be inappropriate when it interferes with other appropriate primary care, or when risk of supportive care outweighs its benefit, i.e. physician/treatment dependence, somatization, illness behavior or secondary gain.

**Preventive/Maintenance Care:** Elective healthcare that is typically long-term, by definition not therapeutically necessary but is provided at preferably regular intervals to prevent disease, prolong life, promote health and enhance the quality of life. This care may be provided after maximum therapeutic improvement, without a trial of withdrawal of treatment, to prevent symptomatic deterioration or it may be initiated with patients without symptoms in order to promote health and to prevent future problems. This care may incorporate screening/evaluation procedures designed to identify developing risks or problems that may pertain to the patient’s health status and give care/advice for these. Preventive/maintenance care is provided to optimize a patient’s health. Maintenance begins when the therapeutic goals of a treatment plan have been achieved and when no further functional progress is apparent or expected to occur

#### Related Policies

Electrodiagnostic Studies

# Chiropractic Services

Orthotics  
Paraspinal Surface Electromyography (SEMG)  
Maximum Units of Service

***\*\*\*Note: This Medical Policy is complex and technical. For questions concerning the technical language and/or specific clinical indications for its use, please consult your physician.***

## Policy

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**BCBSNC will provide coverage for Chiropractic Services when they are determined to be medically necessary because the medical criteria and guidelines shown below are met.**

## Benefits Application

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This medical policy relates only to the services or supplies described herein. Please refer to the Member's Benefit Booklet for availability of benefits. Member's benefits may vary according to benefit design; therefore member benefit language should be reviewed before applying the terms of this medical policy.

## When Chiropractic Services are covered

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Chiropractic Services are considered medically necessary when ALL of the following criteria are met:

1. The service must be medically necessary as defined below:
  - a. The service, procedure or supply must be provided for the diagnosis, treatment, cure, or relief of a health condition, illness, injury or disease; and, except for covered clinical trials (as described in BCBSNC medical policy entitled, "Clinical Trial Services"), not for experimental, investigational or cosmetic purposes.
  - b. It must be necessary for and appropriate to the diagnosis, treatment, cure, or relief of a health condition, illness, injury, disease or its symptoms.
  - c. It must be within generally accepted standards of medical care in the community.
  - d. It must not be solely for the convenience of the insured, the insured's family or the provider.
2. The patient has clinical symptoms of a condition that may be improved or resolved by standard chiropractic therapy.
3. A clear and appropriate treatment plan is documented, including symptoms/diagnosis being treated, diagnostic procedures and treatment modalities used, results of diagnostic procedures, treatments, anticipated length of treatments and quantifiable, attainable treatment goals.
4. The chiropractic diagnostic procedures, treatments are clearly related to the patient's symptoms/condition. Manipulation and modalities must be consistent with the patient's chief complaint, clinical examination findings, diagnoses and treatment plan.
5. Chiropractic care is performed within the scope of the license of a chiropractor.

## When Chiropractic Services are not covered

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Chiropractic Services are not covered in any of the following circumstances:

1. Maintenance programs or supportive care.\*
2. The following therapeutic modalities:
  - a. counseling (considered integral to the visit);
  - b. low level laser therapy (cold laser therapy) is considered investigational for all indications; or
  - c. dry hydrotherapy (i.e., Aquamed, Sidmar).
3. According to North Carolina General Statute 90-151 "Extent and limitation of license - Chiropractors shall not prescribe for or administer to any person any medicine or drugs, nor practice osteopathy or surgery".

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4. There will be no additional reimbursement for the use of the mechanical or electrical devices during manipulations or other treatment modalities, or for the device itself. Device application is considered part of the manipulation and should not be reported separately.
5. Therapeutic manipulation/modalities:
  - a. that are not clearly related to symptoms and/or diagnostic x-rays; or
  - b. that are not likely to result in long term improvement of a member's symptoms/conditions.
6. Nutritional supplements\*\*
7. Services beyond benefit plan visit limitations or services that are excluded from the benefit plan. \*\*
8. Vertebral axial traction or decompression including computerized decompression devices designed to provide mechanical traction is discussed under a separate policy. See BCBSNC medical policy entitled Vertebral Axial Decompression, (Examples: VAX-D, DRX 9000).
9. Hot and cold packs may be considered integral to other modalities and procedures provided. \*\*
10. Paraspinal surface electromyography is discussed under a separate corporate medical policy. See BCBSNC medical policy entitled Paraspinal Surface Electromyography (SEMG).
11. Spinal manipulation under anesthesia is discussed under a separate policy. See BCBSNC medical policy entitled, Spinal Manipulation under Anesthesia.
12. Electrodiagnostic studies unless rendered by a Board Certified Chiropractic Neurologist. See BCBSNC medical policy entitled, Electrodiagnostic Studies.
13. Massage therapy as stand-alone treatment. \*\*
14. Kinesiology taping is considered investigational.

\* Some member benefits may offer coverage for habilitative care, per the terms of the member's benefit booklet. Please refer to the Member's Benefit Booklet for availability of benefits.

\*\*These items may be excluded as a non-covered benefit per the terms of the member's benefit booklet. Please refer to the Member's Benefit Booklet for availability of benefits.

## Policy Guidelines

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The use of an evaluation and management (E/M) code is considered medically necessary no more than once a month unless it is clearly documented that there has been significant interval change to warrant re-examination and/or change in treatment plan.

For chiropractors who are specifically trained in the fitting and management of foot orthotics, the prescribing of foot orthotics may be considered within their scope of practice. (For coverage of foot orthotics, please see Medical Policy entitled Orthotics)

## Billing/Coding/Physician Documentation Information

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This policy may apply to the following codes. Inclusion of a code in this section does not guarantee that it will be reimbursed. For further information on reimbursement guidelines, please see Administrative Policies on the Blue Cross Blue Shield of North Carolina web site at [www.bcbsnc.com](http://www.bcbsnc.com). They are listed in the Category Search on the Medical Policy search page.

*Applicable service codes: 95851, 95852, 95857, 95860, 95861, 95863, 95864, 95867, 95868, 95869, 95870, 95872, 95907, 95908, 95909, 95910, 95911, 95912, 95913, 97010, 97012, 97014, 97016, 97018, 97022, 97024, 97026, 97028, 97032, 97033, 97034, 97035, 97036, 97039, 97110, 97112, 97113, 97116, 97124, 97139, 97140, 97530, 97535, 97537, 97542, 97545, 97546, 97750, 97755,*

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97760, 97761, 97799, 98940, 98941, 98942, 98943, 99202, 99203, 99204, 99205, 99211, 99212, 99213, 99214, 99215, S8948, S8990, S9090.

Constant Attendance Modalities (97010-97039), Therapeutic Procedures (97110-97542), Orthotic Management (97760, 97762), and the unlisted Physical Medicine code (97799) will be limited to a maximum 4 therapeutic modalities per treatment session, not to exceed one hour (4 units) for the combinations of codes submitted.

Most BCBSNC health care plans specifically exclude coverage for acupuncture and acupressure.

97140 services will be denied as integral or mutually exclusive to 98940-98943 services unless submitted with a -59 modifier, indicating a distinct procedural service.

Strapping codes (29200 – 29280, 29520 – 29580, and 29799) are only used for immobilization and should not be used for kinesiology taping.

BCBSNC may request medical records for determination of medical necessity. When medical records are requested, letters of support and/or explanation are often useful, but are not sufficient documentation unless all specific information needed to make a medical necessity determination is included.

Medical records may be requested when the scope, duration or frequency of chiropractic care exceeds standard practice; or if a modifier (e.g., -59) is used more frequently than expected or may not be consistent with claims history.

When records are requested, they should include:

1. Office visit notes, which should include:
  - a. patient name, identifying number, and date of visit,
  - b. physical exam, including pain and function indicators
  - c. diagnostic studies and results,
  - d. results of previous treatments,
  - e. planned treatments and/or diagnostic studies,
  - f. communication to referral source (when appropriate),
  - g. follow-up.
2. Diagnostic x-rays and/or x-ray reports, which should include:
  - a. patient name, identifying number and date of procedure,
  - b. name of provider performing and interpreting the study,
  - c. clear directional markers,
  - d. specific description and diagnosis of x-ray findings.
3. Overall treatment plan.

BCBSNC may request medical records for determination of medical necessity. When medical records are requested, letters of support and/or explanation are often useful, but are not sufficient documentation unless all specific information needed to make a medical necessity determination is included.

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## Scientific Background and Reference Sources

Bronfort, G. Spinal manipulation: current state of research and its indications. *Neurologic Clinics*. February 1999;17(1):92-111

Hurwitz EL, Coulter ID, Adams AH, et al. Use of chiropractic services from 1985 through 1991 in the united states and canada. *Am J Public Health*. 1998;88:771-776

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Shekelle PG, Coulter I, Hurwitz EL, et al. Congruence between decisions to initiate chiropractic spinal manipulation for low back pain and appropriateness criteria in North America. *Ann Intern Med.* 1998 Jul 1;129(1):9-17.

Argoff CE, Wheeler AH. Spinal and radicular pain disorders. *Neurologic Clinics.* November 1998;16(4):833-849.

April 2000, Consultant Advisory Panel review.

Medical Policy Advisory Group - Review - 4/20/00

Specialty Matched Consultant Advisory Panel 9/2000

Medical Policy Advisory Group - 9/2000

Specialty Matched Consultant Advisory Panel - 3/2002

Specialty Matched Consultant Advisory Panel - 10/2003

Specialty Matched Consultant Advisory Panel - 10/2005

Specialty Matched Consultant Advisory Panel - 9/2007

AquaMed Dry Hydrotherapy. JTL Enterprises, Inc. Accessed 9/15/2008 from <http://aquamed.com>.

Sidmar Dry Hydromassage. Princeton, MN: Sidmar Manufacturing, Inc.; Accessed 9/15/2008 from <http://www.sidmar.com>.

Senior Medical Director review 9/22/2008

Senior Medical Director review 1/2009

Specialty Matched Consultant Advisory Panel - 9/2009

Agency for Healthcare Research and Quality (AHRQ) (previously Agency for Healthcare Policy and Research [AHCPR]). Chiropractic in the United States: training, practice and research. Publication No. 98-N002. 1997 Dec. Accessed December 8, 2010. Available at URL address: <http://www.chiroweb.com/archives/ahcpr/uschiros.htm>

Bronfort G, et al. Effectiveness of manual therapies: the UK evidence report. *Chiropractic & Osteopathy* 2010, 18:3. Retrieved August 26, 2011 from <http://chiromt.com/content/18/1/3>.

American Chiropractic Association. Current policies. Retrieved 11/28/2011 from [http://www.acatoday.org/level2\\_css.cfm?T1ID=10&T2ID=117](http://www.acatoday.org/level2_css.cfm?T1ID=10&T2ID=117)

Specialty Matched Consultant Advisory Panel - 9/2011

Medical Director – 12/2011

Specialty Matched Consultant Advisory Panel 9/2012

Specialty Matched Consultant Advisory Panel 9/2013

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Kalron A. A systematic review of the effectiveness of Kinesio Taping®. *Eur J Phys Rehabil Med.* 2013; 49. Retrieved 10/10/2013 from <http://www.ejprm.org/en/onlinejournal.html>

Senior Medical Director – 10/2013

Specialty Matched Consultant Advisory Panel 9/2014

American Chiropractic Association. Retrieved 8/5/2015 from:  
[http://www.acatoday.org/level2\\_css.cfm?T1ID=13&T2ID=61](http://www.acatoday.org/level2_css.cfm?T1ID=13&T2ID=61)

Specialty Matched Consultant Advisory Panel 9/2015

Medical Director review 9/2015

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.56, 2/11/16

Specialty Matched Consultant Advisory Panel 9/2016

Medical Director review 9/2016

Specialty Matched Consultant Advisory Panel 9/2017

Medical Director review 9/2017

Specialty Matched Consultant Advisory Panel 9/2018

Medical Director review 9/2018

Specialty Matched Consultant Advisory Panel 9/2019

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Medical Director review 9/2023

## **Policy Implementation/Update Information**

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4/00 Policy reviewed by Medical Policy Advisory Group

6/00 New policy.

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- 7/00 Coding and billing instructions added to billing section. System coding changes.
- 9/00 Specialty Matched Consultant Advisory Panel. Medical Policy Advisory Group review. Approved. Typographical errors corrected. No change in criteria.
- 12/00 Hot and cold packs added to the list of therapeutic modalities that are not covered. "When Chiropractic Services are not covered" section reworded for clarity. Definition of Maintenance programs streamlined.
- 04/01 Changes in formatting.
- 05/01 Added statement indicating that the prescribing of foot orthotics may be within the scope of practice of chiropractors who have been specifically trained in the fitting and management of foot orthotics.
- 04/02 Specialty Matched Consultant Advisory Panel review. No changes to policy.
- 6/02 "When Chiropractic Services are not covered" section clarified regarding the use of hot or cold packs.
- 7/02 Hot and cold pack usage further defined in "When Chiropractic Services are not covered" section.
- 3/04 Individual CPT codes listed for CPT code ranges 99201-99205; 99211-99215; 97010-97028; 97032-97039; 97110-97799; 98940-98943; 95831-95904 under Billing/Coding section. Benefits Application and Billing/Coding sections updated for consistency. Specialty Matched Consultant Advisory Panel 10/2003. No changes to policy. Reaffirm.
- 10/20/05 Specialty Matched Consultant Advisory Panel review 10/3/2005. No change to policy intent. Changed the word "ameliorated" to "improved" in #1 of the "When covered" section. Added additional information to #8 under "When not covered" to include "computerized decompression devices designed to provide mechanical traction" and "10. paraspinal surface electromyography is discussed under a separate policy. See BCBSNC medical policy entitled Paraspinal Surface Electromyography (Policy number MED1302)". Removed CPT codes from "Billing/Coding section; "95857, 95858, 95875, 97150, 97532, 97533, 97601, 97602, 97780, and 97781" as they are either not applicable to the policy or deleted. Removed list of "The most commonly used and recognized codes". Added "DRX9000, VAX-D, Decompression, Axial, and OTH8030" to "Policy Key Words" section. References added.
- 1/19/06 Removed deleted CPT codes 97020, 97504, 97520, and 97703.
- 9/18/06 Added 4.g. to the "When not covered" section to indicate "low level laser therapy (cold laser therapy) for all indications, including but not limited to: pain relief, arthritis, carpal tunnel syndrome, Raynaud's phenomenon, fibromyalgia, other musculoskeletal disorders, chronic non-healing wound, and neurological dysfunctions." HPCPS code S8948 added to "Billing/Coding" section. Notification given 9/18/06. Effective date 11/27/06.
- 1/17/07 Clarified under "When Not Covered" "4.G. low level laser therapy (cold laser therapy) is considered investigational for all indications".

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- 10/8/07 Specialty Matched Consultant Advisory Panel review 9/13/2007. Removed reference to physical therapy under the "When Not Covered" section. Added for clarification in the "When Not Covered" section; "5. spinal manipulations and other treatment modalities can be provided manually or with the assistance of mechanical or electrical devices. There will be no additional reimbursement for the use of the device or for the device itself. It is considered part of the manipulation and should not be reported separately." and "12. spinal manipulation under anesthesia is discussed under a separate policy. See BCBSNC medical policy entitled, Spinal Manipulation Under Anesthesia (policy number OTH8150)." Updated x-ray codes on the table of Standard Treatment Durations for Chiropractic Care. References added.
- 10/20/08 Added "4. f. dry hydrotherapy (i.e., Aquamed, Sidmar)" under the "When Not Covered" section. Removed statement from the "Table" sections indicating; "For any diagnosis not listed, care plans may be reviewed on an individual consideration basis." References added. Notification given 10/20/08. Effective date 2/2/09
- 2/16/09 Discussed policy with Senior Medical Director 1/9/09. Reviewed the "When Covered" and "When Not Covered" section and revised extensively. Removed the word "neuromusculoskeletal" from number 1. in the "When Covered" section. Under the "When Not Covered" section removed in 1. reference to "preventive or wellness care", reference for condition other than those related to neuromusculoskeletal conditions, and reference to diagnostic procedures/tests not within the routine scope of chiropractic. Under number 2 a. removed "traction (axial or longitudinal)". In 3.expanded the information according to North Carolina General Statute 90-51 "Extent and limitation of license - Chiropractors shall not prescribe for or administer to any person any medicine or drugs, nor practice osteopathy or surgery" Removed "6b.that do not have a clearly defined and achievable end point." Added #12. "Electrodiagnostic studies unless rendered by a Certified Chiropractic Neurologist. See BCBSNC medical policy entitled, Electrodiagnostic Studies (policy number MED1119)." "Policy Guidelines" section revised and the Chiropractic Tables were removed.
- 10/26/09 Specialty Matched Consultant Advisory Panel review 9/24/09. Added additional information to the "When Covered" section to indicate; "1. The service must be medically necessary as defined below: a. The service, procedure or supply must be provided for the diagnosis, treatment, cure, or relief of a health condition, illness, injury or disease; and, except for covered clinical trials (as described in policy MED1093, "Clinical Trial Services for Life Threatening Conditions"), not for experimental, investigational or cosmetic purposes. b. It must be necessary for and appropriate to the diagnosis, treatment, cure, or relief of a health condition, illness, injury, disease or its symptoms. c. It must be within generally accepted standards of medical care in the community. d. It must not be solely for the convenience of the insured, the insured's family or the provider." No change to policy intent. Removed "acupuncture" from the "When Not Covered" section. Added HCPCS code "S8990" to "Billing/Coding" section. Revised statement in the "Billing/Coding" section regarding Constant Attendance Modalities and Therapeutic Procedures to indicate; "Constant Attendance Modalities, 97010-97039, and Therapeutic Procedures, 97110-97542, will be limited to a maximum 4 therapeutic modalities per treatment session, not to exceed one hour (4 units) for the combinations of codes submitted." Added the statement; "Most BCBSNC Health Care Plans specifically exclude coverage for acupuncture and acupressure." References added. (btw)
- 6/22/10 Policy Number(s) removed (amw)

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- 1/24/12 Specialty Matched Consultant Advisory Panel review September 2011. “Description” section revised. Added #13 to the “When Not Covered” section to indicate massage therapy as stand alone therapy is not covered. No change to policy intent. References added. (btw)
- 10/16/12 Specialty Matched Consultant Advisory Panel review 9/21/2012. No change to policy intent. (btw)
- 12/28/12 Removed deleted codes, 95900, 95903, and 95904 from Billing/Coding section. Added new 2013 codes, 95907, 95908, 95909, 95910, 95911, 95912, and 95913. (btw)
- 5/14/13 Changed the following statement in the When Not Covered section from: “Paraspinal surface electromyography is discussed under a separate policy. See BCBSNC medical policy entitled Paraspinal Surface Electromyography” to “Paraspinal surface electromyography is discussed under a separate evidence based guideline. See BCBSNC evidence based guideline entitled Paraspinal Surface Electromyography”. (btw)
- 7/1/13 Updated Billing/Coding section to add 97760 and 97761. Changed the statement under Applicable codes from “Constant Attendance Modalities, 97010-97039, and Therapeutic Procedures, 97110-97542, will be limited to a maximum 4 therapeutic modalities per treatment session, not to exceed one hour (4 units) for the combinations of codes submitted.” to “Constant Attendance Modalities (97010-97039), Therapeutic Procedures (97110-97542), Orthotic Management (97760, 97762), and the unlisted Physical Medicine code (97799) will be limited to a maximum 4 therapeutic modalities per treatment session, not to exceed one hour (4 units) for the combinations of codes submitted.” (btw)
- 10/1/13 Specialty Matched Consultant Advisory Panel review 9/18/2013. No change to policy intent. (btw)
- 10/29/13 Added “14. Kinesiology taping is considered investigational.” to the When Not Covered section. Added the following statement to the Billing and Coding section to indicate; “Strapping codes (29200 – 29280, 29520 – 29580, and 29799) are only used for immobilization and should not be used for kinesiology taping.” Senior Medical Director review 10/11/2013. Reference added. Notification given 10/29/2012. Policy effective 12/31/2013. (btw)
- 10/14/14 Specialty matched consultant advisory panel review meeting 9/2014. Under When Covered Section #4 added Manipulation and modalities must be consistent with the patient’s chief complaint, clinical examination findings, diagnoses and treatment plan. Medical Director Review 10/1/2014. No Change to Policy statement. (lpr) (td)
- 10/30/15 Description section updated. When Covered section updated to add asterisk explanation for number 1. References updated. Specialty Matched Consultant Advisory Panel Review meeting 9/2015. Medical Director review 9/30/2015. Policy intent unchanged. (td)
- 4/29/16 References updated. (td)
- 10/25/16 Specialty Matched Consultant Advisory Panel 9/2016. Medical Director review 9/2016. (jd)
- 10/13/17 Specialty Matched Consultant Advisory Panel 9/2017. Medical Director review 9/2017. (jd)

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- 10/12/18 Minor revision to item 12 in the “When Not Covered” section and to the Billing/Coding section under “When records are requested, they should include:” added pain and function indicators to number 1-b. No change to policy intent. Specialty Matched Consultant Advisory Panel 9/2018. Medical Director review 9/2018. (jd)
- 10/26/18 Minor edit; added “Orthotics” to the Related Policies section. (jd)
- 10/15/19 Specialty Matched Consultant Advisory Panel 9/2019. Medical Director review 9/2019. (jd)
- 12/31/19 The following codes were removed from the Billing/Coding section effective 1/1/20: 95831, 95832, 95833, 95834. (jd)
- 3/10/20 Added “Paraspinal Surface Electromyography (SEMG)” to the Related Policies section and removed S3900 from the Billing/Coding section. No change to policy intent. (jd)
- 10/1/20 Specialty Matched Consultant Advisory Panel 9/2020. Medical Director review 9/2020. (jd)
- 10/1/21 Specialty Matched Consultant Advisory Panel 9/2021. Medical Director review 9/2021. (jd)
- 5/31/22 The following reimbursement policy was added to Related Policies section: Maximum Units of Service. (jd)
- 10/18/22 References updated. Specialty Matched Consultant Advisory Panel 9/2022. Medical Director review 9/2022. (tm)
- 10/10/23 References updated. Code 99201 removed from Billing/Coding section. Specialty Matched Consultant Advisory Panel 9/2023. Medical Director review 9/2023. (tm)

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Medical policy is not an authorization, certification, explanation of benefits or a contract. Benefits and eligibility are determined before medical guidelines and payment guidelines are applied. Benefits are determined by the group contract and subscriber certificate that is in effect at the time services are rendered. This document is solely provided for informational purposes only and is based on research of current medical literature and review of common medical practices in the treatment and diagnosis of disease. Medical practices and knowledge are constantly changing and BCBSNC reserves the right to review and revise its medical policies periodically.