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## Medical Policy



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**Joint Medical Policies are a source for BCBSM and BCN medical policy information only. These documents are not to be used to determine benefits or reimbursement. When Centers for Medicare and Medicaid (CMS) coverage rules are not fully developed, this medical policy may be used by BCBSM or BCN Medicare Advantage plans 42 CFR § 422.101 (b)(6).**

**Please refer to the appropriate certificate or contract for benefit information. This policy may be updated and is therefore subject to change.**

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**\*Current Policy Effective Date: 9/1/26**  
(See policy history boxes for previous effective dates)

### **Title: Programs for Disorders of Consciousness (DoC)**

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#### **Description**

Disorder of consciousness is a state of impaired level of arousal, which is prolonged and characterized by absent or fluctuating wakefulness or awareness. It is categorized into the following states: coma, vegetative state, cognitive motor dissociation, or minimally conscious state based on neurobehavioral function.

Programs for Disorders of Consciousness (DoC) provide specialized, intensive rehabilitation for patients with severe brain injuries (traumatic, anoxic, or stroke) causing minimally conscious or vegetative states. These programs focus on elevating arousal and establishing communication. The primary aim of DoC rehabilitation programs is to promote arousal while identifying and preventing secondary medical complications while providing education and training to the individual's family.

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#### **Medical Policy Statement**

Programs for individuals with disorders of consciousness (DoC) are experimental/investigational. There is insufficient evidence to determine that the programs for DoC result in an improvement in net health outcomes.

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## Inclusionary and Exclusionary Guidelines

N/A

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### CPT/HCPCS Level II Codes

#### Established codes:

N/A

#### Other codes (investigational, not medically necessary, etc.):

S9056

*Note: Code(s) may not be covered by all contracts or certificates. Please consult customer or provider inquiry resources at BCBSM or BCN to verify coverage.*

*Note: Individual policy criteria determine the coverage status of the CPT/HCPCS code(s) on this policy. Codes listed in this policy may have different coverage positions (such as established or experimental/investigational) in other medical policies.*

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## Background

### Disorders of Consciousness Programs

Disorders of consciousness (DoC) programs provide therapy based on an individual's level of awareness. Anticipated referral sources for the comprehensive DoC programs would be the acute care hospital and long-term acute hospitals. To be accepted into a DoC program, the patient's brain injury would typically be one of the five following: coma, vegetative state/unresponsive wakefulness syndrome, cognitive motor dissociation or minimal consciousness state. The average length of stay is dependent on the individual's progress or lack of progress.

### Comatose State

A state of deep, prolonged unconsciousness caused by brain injury, where an individual is unresponsive, unable to be awakened, and lacks a sleep-wake cycle. Signs include closed eyes, no response to pain or sound, and absent voluntary actions.

### Vegetative State/Unresponsive Wakefulness Syndrome

A vegetative state (VS), or unresponsive wakefulness syndrome (UWS), is a disorder of consciousness where patients are awake (eyes open, sleep-wake cycles) but entirely lack self or environmental awareness. They may grind teeth, scream, smile, or shed tears, but show no purposeful responses. It is often caused by severe brain injury (trauma, hypoxia), with prognosis depending on the cause, often deemed permanent after 3-12 months.

## **Cognitive Motor Dissociation**

A condition where individuals with severe brain injuries appear unresponsive but show covert brain activity, indicating consciousness, on advanced imaging (fMRI/EEG) when asked to perform mental tasks. It affects roughly 15-25% of patients diagnosed with disorders of consciousness, often following traumatic injuries or brain hemorrhages.

## **Minimally Conscious State (MCS)**

MCS, a severe alteration of consciousness where individuals show inconsistent, but clear, behavioral evidence of self or environmental awareness. Unlike vegetative states, MCS individuals may show purposeful actions like following commands, reaching for objects, or appropriate smiling/crying. It is often caused by severe brain damage from injuries, strokes, or degenerative diseases.

## **Treatment**

The current standard of care for traumatic brain injury (TBI) patients is progression from the acute care hospital or long-term acute care hospital to an inpatient rehabilitation facility when the member can actively participate in three hours of therapy per day. If the individual is not able to actively participate in therapy, then an alternative level of care would be a skilled nursing facility therapy program or long-term care restorative nursing program. The individual may also be placed back in their own home with 24-hour care by family or hired caregivers and home health care therapy.

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## **Summary of Evidence**

Individuals with disorders of consciousness (DoC), including coma, cognitive motor dissociation, vegetative state/unresponsive wakefulness syndrome, or minimally conscious state, may receive therapies such as arousal programs, sensory stimulation, coma-responsiveness interventions, neuromodulation, or multisensory stimulation. The evidence includes a limited number of systematic reviews evaluating sensory stimulation in comatose individuals. Knowledge of disorders of consciousness studies has been hampered by the heterogeneity of study designs, variables, and outcomes, leading to results that are not comparable for evidence of synthesis. Therefore, there is insufficient evidence to determine that these programs improve net health outcomes.

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## **Rationale**

Evidence reviews assess clinical evidence to determine whether the use of a technology improves the net health outcome. Broadly defined, health outcomes are length of life, quality of life, and ability to function including benefits and harms. Every clinical condition has specific outcomes that are important to individuals and to managing the course of that condition. Validated outcome measures are necessary to ascertain whether a condition improves or worsens; and whether the magnitude of that change is clinically significant. The net health

outcome is a balance of benefits and harms. The following is a summary of the key literature to date.

Acute brain injury, irrespective of the cause, can lead to a disorder of consciousness (DoC) which is characterized by absence, or fluctuating periods of wakefulness or awareness. Clinical management of patients with DoC is especially challenging in the critical care environment, where the level of consciousness, a key factor in determining the trajectory of recovery, may be obscured by analgesia, sedation, or other confounders related to the underlying conditions.

To determine the level of consciousness, individuals in DoC programs are assessed by conducting serial evaluations of consciousness or collecting longitudinal data. Also, tools such as the Coma Recovery Scale- Revised (CRS-R), Disorder of Consciousness Scale, Glasgow Coma Scale (GCS) and Ranchos Cognitive Scale (see appendix) are utilized. Current comprehensive DoC programs include multisensory stimulation (techniques designed to waken the individual from comatose state using the five senses for a brain injury evaluation, otherwise known as coma stimulation). The multidisciplinary approach may involve physical therapy, occupational therapy, speech therapy, neurology, and neuropsychology. Neuro-stimulant medications, such as levodopa, amantadine, modafinil, may be used to improve level of alertness. Also, neuromodulation, such as brain stimulation, may be utilized. The patient would be provided 3 hours of therapy per day by the brain injury team. Initially, the therapy would be provided passively with progression to active assistive participation, then active participation as recovery returned.

Currently, there is no systematic approach for screening and assessing patients in the ICU for DoC. The formal, standardized evaluation of level of consciousness (i.e., coma, VS/UWS, MCS-, MCS+) assessed via tools such as the Coma Recovery Scale-Revised (CRS-R), is rarely employed in routine ICU practice, precluding precise DoC diagnosis. In contrast, the CRS-R is a standardized behavioral assessment specifically designed to detect subtle signs of awareness and diagnose DoC. When CRS-R is employed, it reduces misdiagnosis when compared to a clinical consensus or Glasgow Coma scale (GCS) assessment. The CRS-R comprehensively assesses six domains: auditory function, visual function, motor function, oromotor/verbal function, communication and arousal. DoC diagnosis is based on the presence of specific behaviors within these domains. CRS-R administration requires 25-35 minutes making it to be difficult to serially assess medically unstable ICU individuals. Moreover, the original intention for developing the GCS was to characterize the severity of a traumatic brain injury (TBI) and not to diagnose a state of consciousness. Also, the Glasgow score lacks the sensitivity required to detect subtle signs of awareness. Ranchos Cognitive Scale score (Ranchos Los Amigos (RLA) of cognitive Functioning) is used alongside InterQual level of care criteria to gauge/assess traumatic brain injury recovery. The criteria measure individual's state of consciousness, cognitive responses, and the amount of assistance required to determine if the individual meets clinical criteria for inpatient rehabilitation. Individuals with a traumatic brain injury with a Ranchos Level of I, II and III which include coma, vegetative state/unresponsive wakefulness state, cognitive motor dissociative state or minimally responsive state would be considered to have disorders of consciousness. These individuals require maximal clinical intervention and assistance, and they would be ineligible to participate in a traditional rehabilitation program. Individuals emerging from MCS state (Rancho level III+ or IV) would be considered for traditional rehabilitation programs depending on their capacity to participate in therapy.

## **Review of Evidence**

Individuals with disorders of consciousness (DoC) cannot communicate or participate in assessment of pain or quality of life. The management of these individuals raises important issues particularly with respect to their therapeutic options. Advanced neuroimaging and electrophysiological techniques have highlighted novel insights into the biological mechanisms of recovery of consciousness and have enabled the identification of preserved brain networks in persons who seem unresponsive, thus providing hope for more accurate diagnosis and prognosis. Yet, fundamental questions remain about which patient has the potential for recovery and what effects these new pharmacological agents, neuroimaging, and electrophysiological therapies will provide to reactivate injured neural networks and promote re-emergence of consciousness.<sup>2</sup>

Studies that compare care with and without coma stimulation programs are limited in the current literature in demonstrating consistent, reproducible, and positive impact on health outcomes. In a systematic literature review, Li et al (2020), ten studies were reviewed and concluded that although sensory stimulation programs improved coma arousal and may aid recovery, the authors noted that additional high quality clinical trials with larger sample sizes are needed to establish standard sensory stimulation protocols to improve outcomes after traumatic brain injury (TBI). They found the limitations of the studies to include heterogeneity of outcome evaluation measures, varying interventions, short intervention periods absence of long-term follow-up and small sample sizes.<sup>3</sup>

In April of 2023, a published retrospective cohort study by Zhang et al strongly supported a specialized, intensive, inpatient rehabilitation (IPR) as crucial and time-sensitive for functional recovery from DoC. It is the opinion of the authors that providing such a level of rehabilitative care is equally important for DoC caused by TBI and by hypoxic-ischemic brain injury. Specific goals and different outcome measures (e.g., consciousness level, decannulation, and oral diet initiation) need to be developed to appraise the benefits of acute inpatient rehabilitation for DoC. There is an urgent need to update acute inpatient rehabilitation admission criteria and outcome measures to provide appropriate rehabilitative care to these patients (DoC) and to avoid undue complications resulting from misdiagnosis and negligence of care. More studies from a clinical rehabilitation perspective are needed.<sup>4</sup>

In the systematic review conducted by Alashram et al (2023), the use of noninvasive brain stimulation caused excitatory and inhibitory stimulation to the cerebral cortex of persons who had associated disability following traumatic brain injuries. Ten studies met the inclusion criteria for potential cognitive rehabilitation interventions. Six studies incorporated repetitive transcranial magnetic stimulation (rTMS) as an intervention. The remaining four studies used transcranial direct current stimulation (tDCS). The findings revealed heterogeneous evidence on the cognitive function outcomes for TBI with these two modalities. The effects on cognition were limited with the use of both non-invasive brain stimulation modalities with the optimal stimulation sites and parameters still unknown. Reliable prognostic tools are often lacking at each stage of recovery.<sup>5</sup>

In Giacino et al (2018) systematic reviews were done to highlight gaps in knowledge related to diagnosis, natural history, prognosis, and treatment for patients with DoC. Consistent weaknesses were observed across studies such as small sample size, limited study precision and generalizability. The most important challenge was validation of more precise diagnostic approaches in the absence of established reference (gold standard) with sensitivity and

specificity resulting in higher error rates. Many of the studies required a systematic mechanism for tracking milestones (improvement of the disability, mortality, and recovery of consciousness and etiology of the brain injury (trauma or non-trauma) which obscured the trajectory of recovery. Also, few studies reported long term functional outcomes.<sup>6</sup>

Prognostication or prediction of outcomes has been one of the most difficult aspects of managing individuals with DoC. Fundamental questions remain about which patient has the potential for recovery and what effects the above therapies will provide to reactivate injured neural networks and promote re-emergence of consciousness. The management of these individuals raises important issues particularly with respect to their therapeutic options. DoC is an area of rehabilitation medicine that demonstrates gaps in knowledge related to diagnosis, natural history of recovery, prognosis, and treatment protocols. There is insufficient evidence of efficacy for any indication, for individuals who are comatose, in a vegetative, vegetative/unresponsive wakefulness, or minimally conscious state. There is a lack of controlled studies of sufficient size to support programs for DoC treatment to predict or promote recovery of consciousness.<sup>7</sup>

Kumar et al (2024) conducted a systematic review and meta-analysis on the effectiveness of various coma arousal therapies on individuals with DoC. Studies with interventions that included repetitive transcranial stimulation (rTMS), transcranial direct stimulation (tDCS), tilting, sensory stimulation, and vagus nerve stimulation (VNS) were identified and outcomes evaluated using the Coma Recovery Scale-Revised (CRS-R) with the Glasgow Coma Scale (GCS) used as a secondary outcome measure. The group receiving interventions comprised 31 studies and 574 individuals, and the 19 studies with control groups totaled 417 individuals. All studies measured the behavioral response to the intervention by CRS-R, and six measured consciousness level by GCS. The results showed that all interventions except tilting showed improvement from pretest to posttest, with sensory stimulation showing the largest effect in both groups. A secondary analysis on the duration of the injury was also completed, and those results showed the overall effect of tDCS, rTMS, sensory stimulation, and VNS in injuries over 3 months showed improvement.<sup>8</sup>

In a prospective study conducted by Tinti (2024), investigators indicated whereas several states of disorders of consciousness, including coma, vegetative state/unresponsive wakefulness syndrome and minimally conscious state, a comprehensive neurobiological definition for disorders of consciousness is still lacking. The scientific literature is primarily observational, and studies-specific etiologies lead to disorders of consciousness. Despite advances in these disease-related forms, there remains uncertainty about whether disorders of consciousness are a disease-agnostic unitary entity with a common mechanism, prognosis or treatment response paradigm. Efforts are being initiated to develop a more coordinated effort to allow reliable observational data synthesis and epidemiological estimates and ultimately inform condition-modifying clinical trials.<sup>9</sup>

In 2025, the International Symposium on Intensive Care and Emergency Medicine convened a roundtable of 18 leading clinicians and researchers to review and discuss the latest evidence on epidemiology, diagnosis, treatment, and prognosis of acute disorders of consciousness.<sup>10</sup> The panel developed a six-step roadmap spanning patient identification through family communication and shared decision-making. In addition to providing practical, actionable recommendations, the manuscript highlights key scientific advances that underpin and support current clinical practice. The steps include (1) determining that a patient may have DoC, (2)

identifying, mitigating, and treating confounders that may mask consciousness, (3) conducting standardized, serial assessments to determine level of consciousness, (4) selecting therapeutic interventions, (5) establishing progress, and (6) facilitating family communication and supported decision-making.

### **Section Summary Programs for Disorders of Consciousness:**

There are currently no interventions that have been proven to initiate or accelerate recovery from acute DoC. There are no pharmacologic and neuro-modulatory treatments for DoC that have sufficient evidence to support routine use in the acute intensive care unit (ICU) setting. These approaches should therefore be considered experimental and limited to research protocols or highly selected cases in specialized centers. There is a need for a structured, multidisciplinary approach that integrates general ICU goals with DoC-specific needs should be implemented early to optimize functional outcomes and preserve recovery potential. More research should focus on future potential benefits of rehabilitation for individuals with DoC and it should define the optimal timing, intensity and modalities of rehabilitation therapies. Prognostication in patients with acute DoC is particularly challenging due to the heterogeneity of brain injuries and longitudinal data that may be confounded by withdrawal life sustaining support. Consequently, neuro-prognostication guidelines emphasize the absence of optimal prognostic models and tools, and a high level of uncertainty surrounding DoC outcome prediction. Improving the accuracy of prognostication requires greater awareness of DoC-related challenges in clinical practice, incorporating the perspectives of multiple team members, conducting systematic long-term follow-up, and developing a multimodal approach that integrates diverse sources of data across various post-admission time-points .

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## **SUPPLEMENTAL INFORMATION**

### **CLINICAL INPUT FROM PHYSICIAN SPECIALTY SOCIETIES, ACADEMIC MEDICAL CENTERS AND EXTERNAL STAKEHOLDERS (PRACTICING CLINICIANS AND RESEARCH BASED EXPERTS IN THE FIELD)**

#### **PRACTICE GUIDELINES AND POSITION STATEMENTS**

Guidelines or position statements will be considered for inclusion in 'Supplemental Information' if they are issued by, or jointly by, a US professional society, an international society with US representation, or National Institute for Health and Care Excellence (NICE). Priority will be given to guidelines that are informed by a systematic review, include strength of evidence ratings, and include a description of management of conflict of interest.

#### **American Academy of Neurology (AAN)<sup>6</sup>**

In a 2018 practice guideline (reaffirmed in September 2021) regarding disorders of consciousness, the AAN does not address the use of stimulation as a treatment modality for patients with a prolonged disorder of consciousness. They recommend families to be counseled regarding the limitations of existing evidence associated with interventions that lack support and there are no established therapies for children with a prolonged disorder of consciousness.

## **International Cognitive (INCOG)<sup>2</sup>**

INCOG in their 2023 guidelines for cognitive rehabilitation issues eight recommendations for memory rehabilitation post traumatic brain injury. These guidelines do not include participation in any programs for disorders of consciousness.

## **European Academy of Neurology (EAN)<sup>11</sup>**

The EAN, in 2020, issued recommendations for the evaluation of coma and other DoC. These recommendations do not include participation in specific programs for DoC.

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## **Regulatory Status**

N/A

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## **Government Regulations**

### **National:**

There is no NCD regarding disorders of consciousness.

### **Local:**

There is no LCD regarding disorders of consciousness.

According to the 2026 CMS Physician fee schedule, code S9056 does not have a fee attached.

*(The above Medicare information is current as of the review date for this policy. However, the coverage issues and policies maintained by the Centers for Medicare & Medicare Services [CMS, formerly HCFA] are updated and/or revised periodically. Therefore, the most current CMS information may not be contained in this document. For the most current information, the reader should contact an official Medicare source.)*

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## **Related Policies**

- Cognitive Rehabilitation
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## **References**

1. Mainali S, Nobleza C, Edlow B, et al. Coma and disorders of consciousness: An overview. *Frontiers in Human Neuroscience*. February 2024; 18(1). PMID 38445097
2. Ponsford, J, Velikonja D, Janzen S, et al. INCOG 2.0 guidelines for cognitive rehabilitation following traumatic brain injury, Part II: Attention and information processing speed. *J Head Trauma Rehab*. February 2023; 38(1): 38-51.
3. Li J, Cheng C, Fang-Kun L, et al. Sensory stimulation to improve arousal in comatose patients after traumatic brain injury: A systematic review of the literature. *Neurology Science*. September 2020; 41(9): 2367-2376.

4. Zhang B, O'Brien K, Woo J, et al. Specialized intensive inpatient rehabilitation is crucial and time sensitive for functional recovery from disorders of consciousness. *Frontiers in Neurology*. April 2023; 14. PMID 37090984.
5. Alashram A, Padua E, Annino G. Non-invasive brain stimulation for cognitive rehabilitation following traumatic brain injury: A systematic review. *Applied Neuropsychol Adult*. November 2023; 30(6): 814-829. PMID: 35771044.
6. Giacino JT, Katz DI, Schiff ND, et al. Comprehensive systematic review update summary: Disorders of consciousness: Report of the guideline development, dissemination, and implementation subcommittee of the American Academy of Neurology; the American Congress of Rehabilitation Medicine; and the National Institute on Disability, Independent Living, and Rehabilitation Research. *Neurology*. September 2018; 91(10): 461-470. PMID 30089617.
7. Russell, M, Ivanhoe C. Prognostication and trajectories of recoveries in DoC. *PM&R Clinics of North America*. February 2024; 35(1): 163-173.
8. Kumar S, Agarwal N, Sanal TS. Effectiveness of coma arousal therapy on patients with disorders of consciousness: A systematic review and meta-analysis. *Brain Circ*. June 2024; 10(2): 119-133.
9. Tinti, L., Lawson, T., Research Considerations for Prospective Studies of Patients with Coma and Disorders of Consciousness, *Brain Communication*. 2024 Jan 29;6(1):fcae22. PMID 38344653
10. Bodien YG, Busi KM, Chang CWJ, et al. Disorders of consciousness diagnosis, interventions, and prognostication for the intensivist: Report of the 2025 ISICEM roundtable. *Intensive Care Med*. December 2025; 52(1): 42-62.
11. Kondziella D, Bender A, Diserens K, et al. European Academy of Neurology guideline on the diagnosis of coma and other disorders of consciousness. *European J Neurology*. January 2020; 27: 741-756.

*The articles reviewed in this research include those obtained in an Internet based literature search for relevant medical references through May 2026, the date the research was completed.*

## Appendix

The 10 Levels of Rancho Los Amigos-Revised:

1. **Level I No Response:** Patient shows no observable response to stimuli, may demonstrate generalized reflex responses to painful stimuli.
2. **Level II – Generalized Response:** Responses are inconsistent and non-purposeful, often physiological or gross body movements, may respond to repeated auditory or painful stimuli.
3. **Level III – Localized Response:** Patient reacts specifically to stimuli, may follow simple commands inconsistently, shows withdrawal or vocalization to pain.
4. **Level IV – Confused Agitated: Agitated:** Heightened activity, purposeful attempts to remove restraints, brief attention, absent short-term memory, may exhibit aggressive or flight behavior.
5. **Level V – Confused-Inappropriate, Non-Agitated:** Shows carryover for relearned tasks, maximum assistance for new learning, unaware of impairments, follows simple directions consistently.
6. **Level VI – Confused-Appropriate:** Moderate assistance for orientation to time, able to attend to familiar tasks for 30 minutes, minimal supervision for new learning, superficial awareness of condition.
7. **Level VII – Automatic-Appropriate:** Performs familiar routines independently with shallow recall, monitors accuracy with minimal assistance, minimal supervision for safety.
8. **Level VIII – Purposeful-Appropriate:** Aware of impairments, takes corrective action with stand-by assistance, can handle familiar tasks independently, begins to think about consequences with assistance.
9. **Level IX – Purposeful-Appropriate, Stand-By Assistance on Request:** Independently completes familiar and some unfamiliar tasks, uses assistive memory devices, acknowledges others' needs with stand-by assistance.
10. **Level X – Purposeful-Appropriate, Modified Independent:** Handles multiple tasks in all environments, independently maintains memory aids, anticipates problems, and adjusts behavior appropriately.

### Joint BCBSM/BCN Medical Policy History

| Policy Effective Date | BCBSM Signature Date | BCN Signature Date | Comments                 |
|-----------------------|----------------------|--------------------|--------------------------|
| 9/1/26                | 6/16/26              |                    | Joint policy established |

Next Review Date: 2<sup>nd</sup> Qtr., 2027

### Pre-Consolidation Medical Policy History

| Original Policy Date | Comments |
|----------------------|----------|
| BCN:                 | Revised: |
| BCBSM:               | Revised: |

**BLUE CARE NETWORK BENEFIT COVERAGE**  
**POLICY: PROGRAMS FOR DISORDERS OF CONSCIOUSNESS (DoC)**

**I. Coverage Determination:**

|                                                                                            |                                                             |
|--------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| <b>Commercial HMO<br/>(includes Self-Funded<br/>groups unless otherwise<br/>specified)</b> | Not Covered                                                 |
| <b>BCNA (Medicare<br/>Advantage)</b>                                                       | See government section                                      |
| <b>BCN65 (Medicare<br/>Complementary)</b>                                                  | Coinsurance covered if primary Medicare covers the service. |

**II. Administrative Guidelines:**

- The member's contract must be active at the time the service is rendered.
- Coverage is based on each member's certificate and is not guaranteed. Please consult the individual member's certificate for details. Additional information regarding coverage or benefits may also be obtained through customer or provider inquiry services at BCN.
- The service must be authorized by the member's PCP except for Self-Referral Option (SRO) members seeking Tier 2 coverage.
- Services must be performed by a BCN-contracted provider, if available, except for Self-Referral Option (SRO) members seeking Tier 2 coverage.
- Payment is based on BCN payment rules, individual certificate and certificate riders.
- Appropriate copayments will apply. Refer to certificate and applicable riders for detailed information.
- CPT - HCPCS codes are used for descriptive purposes only and are not a guarantee of coverage.