
Medical Policy



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***Current Policy Effective Date: 5/1/12**
(See policy history boxes for previous effective dates)

Title: Coma Stimulation (Sensory Stimulation for Coma Patients)

Description/Background

Coma is defined as the total absence of awareness of self and environment even when the subject is externally stimulated. Coma stimulation is a planned series of activities aimed at arousing a person from a comatose state.

Coma stimulation, also known as sensory stimulation, coma management and coma arousal therapy, allegedly promotes the rate of coma arousal and enhances the rehabilitative potential of coma patients. The hypothesis behind coma stimulation is that a person may be “reached” through the use of external sensorimotor input while in a coma. Protocols may involve stimulation of any or all of the visual, auditory, olfactory, gustatory, cutaneous and kinesthetic senses. Various stimuli may be used for each sense. Protocols may differ with respect to who performs the stimulation and where the stimulation is performed. Professionals who may provide the service include nurses, occupational therapists, physical therapists or speech-language therapists. In some cases, family members may be trained in the techniques and are given primary responsibility for providing the therapy. Treatment may be delivered in the hospital, the patient’s home or in a nursing home.

It has been suggested that increasing baseline stimulation to critical brain structures, particularly the reticular activating system, promotes the arousal and recovery of comatose patients. Suggestive findings of this approach include reports of increased arousal and improvement following dorsal column stimulation, as evidenced by electroencephalographic activity in patients who have been in prolonged vegetative states.

There are four scientific theories that address the issue of the brain’s apparent adaptability in recovering from brain injury. They include spare capacity and reorganization, redundancy, response at a cellular level and environmental effects.

- **Spare capacity and reorganization** refer to the brain's apparent ability to reorganize its functions following injury. The premise of this theory is that many parts of the brain are non-active or "spare," so that when damage to one part of the brain occurs, this "spare" area is able to assume the function of the damaged area, thereby compensating for any potential loss of function.
- The **redundancy theory** is closely related to the theory of reorganization and refers to the brain's apparent ability to duplicate neuronal pathways. Therefore, it is believed that if one brain pathway is damaged, the other will be able to take over.
- The **response at a cellular level theory** revolves around the scientific fact that when cells in the central nervous system have died, recovery does not occur. From this has come research on the subsequent effects on cells around the dead area. It is hypothesized that the undamaged axons of the neurons send out new connections in an attempt to re-wire the system, a process called collateral sprouting. In this way, the brain attempts to compensate for its inability to grow new cells.
- The **environmental effects theory** refers to the improved performance that is noted in animals and humans when increased environmental stimulation occurs.

Proponents of coma arousal therapy state that its effectiveness lies in the frequency, intensity and duration of environmental stimuli that the patient receives. Stimuli may be applied through the five senses (vision, hearing, touch, taste and smell) by which the brain receives information from the outside world, and by physical movement. Sensory stimuli are felt to be essential factors in stimulating the reticular activating system (consciousness control center) which maintains consciousness.

Modalities used for stimulating various sensory organs may include:

- **Auditory**
 - Banging items together
 - Ringing bells
 - Playing music
 - Whistling
 - Talking
 - Playing the television or radio
- **Tactile**
 - Rubbing different textures against the skin
 - Exposing the body to changes in temperature
 - Deep pressure massage
- **Visual**
 - Showing pictures of family and friends
 - Bright colors
 - Moving objects, flash cards
- **Olfactory**
 - Familiar fragrances
 - Strong smells, such as garlic, peppermint, citrus fruit
- **Taste**
 - Swabs with strong tastes, such as peppermint, lemon
 - Mustard
 - Salt

- **Proprioception**
 - Range of motion exercises
 - Alternating movements (arms and legs)
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CPT/HCPCS Level II Codes and Description *(Note: The inclusion of a code in this list is not a guarantee of coverage. Please refer to the medical policy statement to determine the status of a given procedure)*

Established codes:

N/A

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

S9056 Coma stimulation, per diem

Medical Policy Statement

Coma stimulation is experimental and investigational. It has not been scientifically demonstrated to be an effective treatment for arousing patients from a coma or persistent vegetative state.

Rationale

A literature search from January 2000 through January 2006 did not identify any controlled studies of coma stimulation therapy. As there is limited knowledge regarding information processing in the brain-injured state, there is no scientific or theoretical basis for coma stimulation. Although coma stimulation theory appears logical, there is no conclusive evidence that comatose patients respond any better, differently or with any sustained increase in level of consciousness with this treatment than without it. There have been very few studies done on small numbers of patients and there has been no standardization of the testing or outcome measures. There is also no standardization of patient selection criteria for coma stimulation related to the length of time between injury and institution of rehabilitation. The types of therapy and the length and/or frequency of each stimulation session also vary. Of the few studies that have been done, most have failed to demonstrate any significant improvement in patient outcomes.

Inclusionary and Exclusionary Guidelines (Clinically based guidelines that may support individual consideration and pre-authorization decisions)

N/A

Related Policies

Cognitive Rehabilitation

Medicare Information

There is no Medicare (national or local) or Medicaid policy on coma stimulation. Coma stimulation does not meet Medicare guidelines for physical medicine and rehabilitation. Medicare requires that a “physical therapy service must be reasonable and necessary for the treatment of the patient’s illness. If the patient’s expected restoration potential would be insignificant in relation to the extent and duration of physical therapy services required to achieve such potential, the physical therapy would not be considered reasonable and necessary. In addition, there must be an expectation that the patient’s condition will improve significantly in a reasonable (and generally predictable) period of time.” Coma stimulation meets none of these guidelines.

(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 & Medicaid 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.)

References

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The articles reviewed in this research include those obtained in an Internet based literature search for relevant medical references through January 9, 2012, the date the research was completed.

Joint BCBSM/BCN Medical Policy History

Policy Effective Date	BCBSM Signature Date	BCN Signature Date	Comments
9/30/04	9/30/04	9/28/04	Joint medical policy established
7/1/07	5/10/07	5/28/07	Routine maintenance
11/1/08	8/19/08	10/29/08	Routine maintenance
5/1/12	2/21/12	2/21/12	Routine maintenance; policy retired as obsolete.

This policy is retired as obsolete and will no longer be routinely reviewed.

Pre-Consolidation Medical Policy History

Original Policy Date	Comments
BCN 11/5/01	Revised: N/A
BCBSM N/A	Revised: N/A

**BLUE CARE NETWORK BENEFIT COVERAGE
POLICY: COMA STIMULATION**

I. Coverage Determination:

Commercial HMO (includes Self-Funded groups unless otherwise specified)	Not covered.
BCNA (Medicare Advantage)	Not covered.
BCN65 (Medicare Complementary)	Coinsurance covered if primary Medicare covers the service.
BlueCaid	Not covered.

II. Administrative Guidelines:

N/A