



CIGNA MEDICAL COVERAGE POLICY

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Subject **Gait Analysis**

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Hyperlink to Related Coverage Policies

Electromyography Studies
Neurosurgical Treatment of Spasticity

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Coverage Policy

CIGNA covers gait analysis as medically necessary when BOTH of the following criteria are met:

- A child or adolescent has a diagnosis of cerebral palsy.
- The procedure is performed as part of a preoperative assessment, and the results will be used in surgical planning.

CIGNA does not cover gait analysis for any other indication, because it is considered experimental, investigational or unproven.

General Background

Gait analysis is the systematic evaluation of the dynamics of gait. It is a process of measuring and evaluating the walking patterns of patients with specific gait-related problems. Gait analysis is also referred to as motion analysis. Observational gait analysis, the standard method of evaluating gait, refers to the visual assessment of a patient's gait, with specific attention to hips, knees and ankles. Gait analysis by observer assessment does not use any specialized equipment, can adequately assess most conditions, and is used to note gross abnormalities in gait.

Gait analysis may also be performed in a gait analysis laboratory using specialized technology. This is also referred to as computerized gait analysis, quantitative gait analysis or clinical gait analysis. This procedure has

been used to understand the etiology of gait abnormalities and as part of the treatment decision-making in patients with complex walking problems. It has been most often used for patients with neuromuscular conditions, primarily as part of the surgical decision-making process when all conservative measures have been exhausted and surgical intervention is being considered. Computerized gait analysis is a process by which gait characteristics are measured, abnormalities are identified, causes are suggested and treatments are proposed. It is not intended to replace the clinical examination, but rather serves as an adjunct to understand the impairment better. The treatment decision should be made in the total context of the patient's condition, physical examination and medical history.

The technologies involved in clinical gait analysis include:

- Specialized computer-interfaced video cameras that measure patient motion. An initial videotape is recorded to provide documentation of how a patient walks and the patient's gait pattern.
- Passive reflective markers are placed on the surface of a patient's skin, aligning with specific bony landmarks and joints. As the patient walks along a straight pathway in the laboratory, the locations of the markers are monitored with a three-dimensional motion data-capture system comprising five or six special video cameras, all interfaced with a central controlling computer. An infrared light is reflected from the markers back to the cameras. Marker position data allow for the computation of the angular orientation of particular body segments as well as of the angles between segments (joint angles); these data are collectively referred to as kinematics.
- Multicomponent force platforms imbedded in the walkway provide measurement of reaction between foot and ground as the patient walks. The data are assessed directly or used to calculate the load in and across the joints. The joint load is referred to as kinetics.
- Electrodes placed on the surface of the skin or inserted as fine wires into specific muscles allow the muscle to be monitored as the patient walks. This is referred to as dynamic electromyography (EMG). This technique measures the electrical potential generated by a muscle when it is activated. This information, along with joint kinematic and kinetic results, is used to assess the gait abnormalities.

An extensive physical examination of the patient at rest should be performed. This information may then be correlated with the gait data. The gait analysis will usually take two to four hours to complete. In order to perform gait analysis, the patient must be ambulatory with or without assistive devices for a minimum of 10 consecutive steps. The patient must also be able to follow directions and be cooperative during the procedure. The gait analysis data are often interpreted by a team that includes the orthopedic surgeon; the physical therapist or kinesiologist who collected the data; and, at times, the engineer who collected data or the biomechanical engineer who developed the mathematical models used for processing the data. The information from the gait analysis is used along with results of the clinical examination to identify gait deviations, determine potential causes and determine treatment.

The most frequent application of gait analysis is in the treatment of children and adolescents with cerebral palsy, when surgical treatment is being considered. The orthopedic difficulties encountered in children with cerebral palsy are frequently a result of high muscle tone, spasticity and rigidity that prevent normal growth of muscle and cause contractures. Treatment of this condition includes physical therapy, occupational therapy, casting, orthotics and medication. Surgery is often recommended when contractures are severe enough to cause movement problems. Gait analysis may be utilized to determine if surgery is necessary and to determine which surgical procedure is appropriate. There are several published studies regarding the use of gait analysis to provide objective information in the surgical planning process for this condition.

Literature Review

There have been several prospective and retrospective studies that have been published regarding the utilization of gait analysis in the surgical decision-making process in children and adolescents with cerebral palsy (Gough, et al., 2008; Lofterod, et al., 2008; Filho, et al., 2080; Lofterod, et al., 2007; Molenaers, et al., 2006; Kawamura, et al., 2006; Desloovere, et al., 2006; Chang, et al., 2006; Cook, et al., 2003; Kay, et al., 2000; DeLuca, et al., 1997). These studies have demonstrated that the use of gait analysis alters the decision making and changes the treatment that these patients receive, including confirming clinical indications for surgery, and for excluding or delaying surgery that was clinically proposed.

A retrospective study evaluated the effect of gait analysis on the amount of surgery children with cerebral palsy undergo (Wren, et al., 2009). The study involved 313 children who received gait analysis and 149 children who

received not gait analysis before their initial surgery. After adjusting for differences in age and severity of functional problems, it was found that the gait analysis group had more distinct procedures during the initial surgery than the non-gait analysis group. However, only 11% of the gait analysis children needed additional surgery in contrast to 32% of the non-gait analysis group. The study indicated that use of gait analysis was associated with a lower incidence of additional surgery.

Summary

The published peer-reviewed scientific literature indicates that clinical gait analysis may be an effective tool in the surgical decision-making process for children and adolescents with cerebral palsy. It may be performed to assist in determining if surgery is necessary and to determine which surgical procedure is appropriate. There is insufficient evidence in the published, peer-reviewed scientific literature to conclude that gait analysis has a role in the diagnosis or management of other medical conditions. Well-designed clinical trials are needed to demonstrate the clinical benefit of this procedure for other medical conditions.

Coding/Billing Information

Note: This list of codes may not be all-inclusive.

Covered when medically necessary:

CPT®* Codes	Description
96000	Comprehensive computer-based motion analysis by video-taping and 3-D kinematics
96001	Comprehensive computer-based motion analysis by video-taping and 3-D kinematics; with dynamic plantar pressure measurements during walking
96002	Dynamic surface electromyography, during walking or other functional activities, 1-12 muscles
96003	Dynamic fine wire electromyography, during walking or other functional activities, 1 muscle
96004	Physician review and interpretation of comprehensive computer based motion analysis, dynamic plantar pressure measurements, dynamic surface electromyography during walking or other functional activities, and dynamic fine wire electromyography, with a written report

ICD-9-CM Diagnosis Codes	Description
343.0-343.9	Infantile cerebral palsy

*Current Procedural Terminology (CPT®) © 2010 American Medical Association: Chicago, IL.

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Policy History

<u>Pre-Merger Organizations</u>	<u>Last Review Date</u>	<u>Policy Number</u>	<u>Title</u>
CIGNA HealthCare	4/15/2008	0315	Gait Analysis

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