



**EFFECTIVE DATE:** 02|03|2015  
**POLICY LAST UPDATED:** 04|06|2022

## OVERVIEW

Gait analysis is the quantitative laboratory assessment of coordinated muscle function, typically requiring a dedicated facility and staff and analysis of a video-recorded observation of a patient walking. Gait analysis has been proposed as an aid in surgical planning, primarily for children with cerebral palsy. It is also a potential tool to help plan rehabilitative strategies for ambulatory problems related to cerebral palsy, aging, stroke, spinal cord injury, and other conditions.

## MEDICAL CRITERIA

Not applicable

## PRIOR AUTHORIZATION

Not applicable

## POLICY STATEMENT

### Medicare Advantage Plans

Gait analysis is covered with a diagnosis of cerebral palsy. For all other indications, it is considered not covered as the evidence is insufficient to determine the effects of the technology on health outcomes.

### Commercial Products

Gait analysis is covered with a diagnosis of cerebral palsy. For all other indications, it is considered not medically necessary as the evidence is insufficient to determine the effects of the technology on health outcomes.

## COVERAGE

### Medicare Advantage Plans and Commercial Products

Benefits may vary between groups and contracts. Please refer to the appropriate Benefit Booklet, Evidence of Coverage or Subscriber Agreement for applicable not medically necessary/not covered benefits/coverage.

## BACKGROUND:

Gait analysis is the quantitative assessment of coordinated muscle function. Evaluation is conducted in a laboratory and typically involves a dedicated facility and staff. A visual assessment of walking is supplemented by video recording. Videos can be observed from several visual planes at slow speed, allowing detection of movements not observable at normal speed. Joint angles and various time-distance variables, including step length, stride length, cadence, and cycle time, can be measured. Electromyography (EMG), assessed during walking, measures timing and intensity of muscle contractions. This calculation allows determination of whether a certain muscle's activity is normal, out of phase, continuous, or clonic.

Kinematics is the term used to describe movements of joints and limbs, such as angular displacement of joints and angular velocities and accelerations of limb segments. The central element of kinematic assessment is some type of marker system that is used to represent anatomic landmarks, which are then visualized and quantitatively assessed during analysis of videotaped observations. Movement data are compiled by computer from cameras oriented in several planes, and the movement data are processed so that the motion of joints and limbs can be assessed in 3 dimensions. The range and direction of motion of a particular joint can be

isolated from all the other simultaneous motions that are occurring during walking. Graphic plots of individual joint and limb motion as a function of gait phase can be generated.

Kinetics is the term used to describe those factors that cause or control movement. Evaluating kinetics involves the use of principles of physics and biomechanics to explain the kinematic patterns observed and to generate analyses that describe the forces generated during normal and abnormal gait analysis.

Gait analysis has been proposed as an aid in surgical planning, primarily for cerebral palsy but also for other conditions, such as clubfoot. In addition, gait analysis is being investigated as a means to plan rehabilitative strategies (i.e., orthotic-prosthetic devices) for ambulatory problems related to cerebral palsy, aging, stroke, spinal cord injury, etc.

Gait analysis is the quantitative assessment of coordinated muscle function. For patients with cerebral palsy undergoing surgery for gait disorders, one randomized controlled trial did not find improvement in health outcomes for patients who received gait analysis as part of surgical planning, and one non-randomized controlled trial did not find improvement in utilization parameters. Several studies conducted among patients with cerebral palsy and other conditions suggest that gait analysis recommendations impact treatment decisions, but the impact of these decisions on health outcomes is as yet unknown. Based on input from clinical reviewers, gait analysis, when comprehensive, may be medically necessary for planning prior to surgery in children with gait disorders associated with cerebral palsy. For all other indications, gait analysis is considered not medically necessary due to no proven efficacy.

## **CODING**

### **Medicare Advantage Plans and Commercial Products**

The following codes are considered medically necessary when filed with the below diagnosis codes:

- 96000** Comprehensive computer-based motion analysis by video-taping and 3D kinematics
- 96001** Comprehensive computer-based motion analysis by video-taping and 3D 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 written report.

Gait Analysis ICD-10-CM codes:

**G80.0-G80.9**

## **RELATED POLICIES**

None

## **PUBLISHED**

- Provider Update, June 2022
- Provider Update, December 2021
- Provider Update, January 2021
- Provider Update, October 2019
- Provider Update, February 2019

## **REFERENCES**

1. Cutti A, Ferrari A, Garofalo P et al. 'Outwalk': a protocol for clinical gait analysis based on inertial and magnetic sensors. *Med Biol Eng Comput* 2010; 48(1):17-25.
2. van den Noort JC, Ferrari A, Cutti AG et al. Gait analysis in children with cerebral palsy via inertial and magnetic sensors. *Med Biol Eng Comput* 2013; 51(4):377-86.

3. Dobson F, Morris ME, Baker R et al. Gait classification in children with cerebral palsy: a systematic review. *Gait Posture* 2007; 25(1):140-52.
4. Noonan KJ, Halliday S, Browne R et al. Interobserver variability of gait analysis in patients with cerebral palsy. *J Pediatr Orthop* 2003; 23(3):279-87.
5. Wren TA, Otsuka NY, Bowen RE et al. Outcomes of lower extremity orthopedic surgery in ambulatory children with cerebral palsy with and without gait analysis: Results of a randomized controlled trial. *Gait Posture* 2012 [Epub ahead of print].
6. Wren TA, Kalisvaart MM, Ghatan CE et al. Effects of preoperative gait analysis on costs and amount of surgery. *J Pediatr Orthop* 2009;29(6):558-63.
7. Lofterod B, Terjesen T, Skaaret I et al. Preoperative gait analysis has a substantial effect on orthopedic decision making in children with cerebral palsy: comparison between clinical evaluation and gait analysis in 60 patients. *Acta Orthop* 2007; 78(1):74-80.
8. Lofterod B, Terjesen T. Results of treatment when orthopaedic surgeons follow gait-analysis recommendations in children with CP. *Dev Med Child Neurol* 2008; 50(7):503-9.
9. Gough M, Shortland AP. Can clinical gait analysis guide the management of ambulant children with bilateral spastic cerebral palsy? *J Pediatr Orthop* 2008; 28(8):879-83.
10. Wren TA, Gorton GE, Ounpuu S et al. Efficacy of clinical gait analysis: a systematic review. *Gait Posture* 2011; 34(2):149-53.
11. Suda Y, Saitou M, Shibasaki K et al. Gait analysis of patients with neurogenic intermittent claudication. *Spine* 2002; 27(22):2509-13.
12. Sankar WN, Rethlefsen SA, Weiss J et al. The recurrent clubfoot: can gait analysis help us make better preoperative decisions? *Clin Orthop Relat Res* 2009; 467(5):1214-22.
13. Sponsored by the Hospital for Sick Children. Outcomes of orthopedic surgery using gait laboratory versus observational gait analysis in children with cerebral palsy (NCT00419432). Available online at: [www.clinicaltrials.gov](http://www.clinicaltrials.gov). Last accessed January, 2013.

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