

ottobock.

C-Brace[®]

Step into the future.™



Quality for life

Information for practitioners

C-Brace®

Reshaping the future of orthotics

Ottobock has fundamentally changed orthotics with the C-Brace. The world's first mechatronic stance and swing phase control orthosis (SSCO®) system, which controls both the stance and swing phase hydraulically with microprocessor sensor technology, remains unique.

The functionality of conventional paralysis orthoses is limited to releasing and locking the knee joint. However, the C-Brace, with its microprocessor-controlled hydraulic unit, supports the user during the entire gait cycle and adapts to everyday situations in real-time. Flexion during weight-bearing, navigating slopes, walking on uneven terrain, or going down stairs step-over-step—all this defines a new level of mobility.

The C-Brace takes stability and safety to a new level with its stumble recovery feature, which actively controls and adjusts swing flexion resistance while the knee is in motion. This ensures the proper amount of resistance is in place so the user has time to recover, in the event of a stumble.

What's more, the C-Brace offers entirely new possibilities for Orthotists and users alike. For one, the fitting process has been significantly simplified as Orthotists have the option to fabricate the C-Brace themselves using wet lamination.* Also, the individual settings for the user can be easily configured using the Setup™ app.

The C-Brace is lightweight and low-profile, giving users the option of wearing it underneath their clothing. Using the Cockpit™ app, users can easily configure the joint settings or check the battery status, which is also visible on the LED display. The new sensor technology is more intuitive to use, making the motion sequences more dynamic and sensitive.

The C-Brace is reshaping the future of orthotics.

*Facilities interested in fabricating the C-Brace must go through the application process. For more information, contact customer service or your local sales representative.



The new C-Brace

- Low-profile: the C-Brace can be worn under clothing
- Lighter: users have to expend less effort while walking
- The C-Brace microprocessor sensor technology is more intuitive to use, and the hydraulically controlled motion sequences are more dynamic and sensitive
- Orthotists have the option to fabricate the C-Brace themselves using wet lamination*
- Easy adjustments with the Setup app
- Users can change various settings using the Cockpit app: mode, fine-tuning, etc.
- New external mounting makes it easier to switch out the C-Brace joint unit

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Key features at a glance

- One-of-a-kind SSCO system
- Microprocessor-controlled hydraulic stance and swing phase
- Entire gait cycle is controlled dynamically and in real-time
- System responds quickly to any situation

New options for users

- Flexion during weight-bearing is now possible for the first time - for example, when sitting down, walking down stairs step-over-step, and walking down inclines
- Controlled and stable gait characteristics on uneven terrain
- Individual operating modes can be set by the Orthotist and selected by the user according to the situation, e.g. cycling
- Natural body posture helps reduce contra-lateral physical strain and resulting conditions
- Potential for reducing energy expenditure, especially when compared to locked systems
- Enhanced quality of life with the newfound mobility and a greater feeling of safety
- The Cockpit app allows users to make minor adjustments all from their smart phone or tablet: tailoring joint stiffness, changing modes, adjusting pitch and volume, and turning on/off certain features
- The freeze feature can be turned on by the user to lock the joint at any angle in both the flexion and extension directions

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Walking, recalculated

The SSCO system consists of custom fabricated thigh, calf, and foot components. Acceleration and rotation rates in all movement directions are measured in the C-Brace joint unit. This allows the orientation and movement of the system in space to be calculated in three dimensions. Additional sensors measure the transmitted knee moment and knee angle.

There are no external cables as all sensors are integrated into the C-Brace joint unit, and

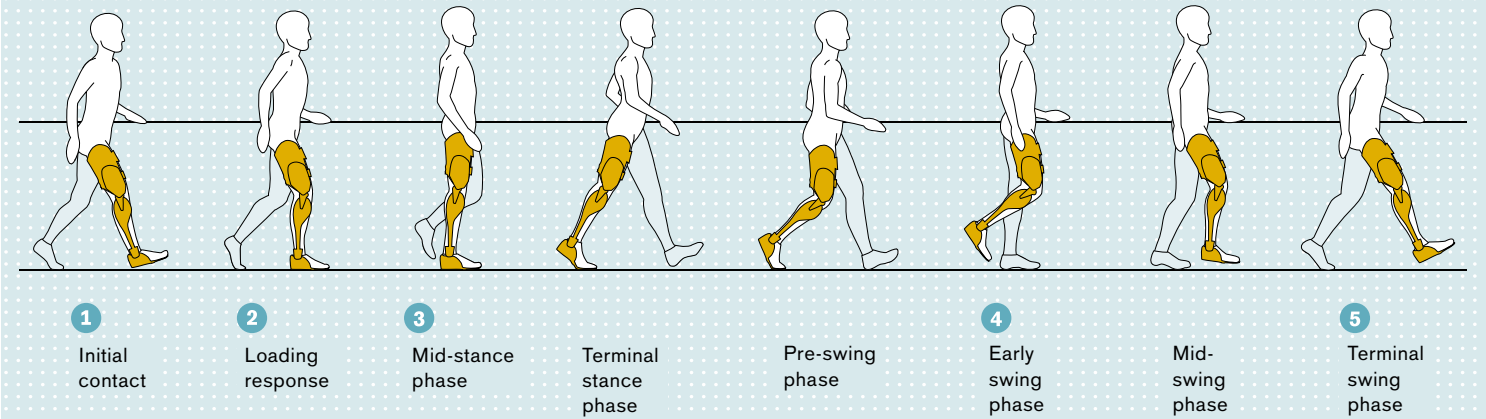
information from the ankle or foot region is not required.

The system recognizes which phase of the gait cycle the user is in. The hydraulic resistances are regulated accordingly, while flexion and extension are controlled. Thanks to real-time calculations, the C-Brace optimizes gait pattern in each individual phase of gait.

Gait cycle

Functional compensation by the C-Brace[®]

The phases of walking – functional compensation by the C-Brace[®]



1. Stance phase flexion resistance

Controlled stance phase damping supports the knee extension musculature upon heel strike

2. Stance phase flexion resistance while walking on level surfaces

Additional damping option that supports the musculature as needed upon increased load transfer; time limitation for additional stance phase damping

3. Stance phase extension resistance

Damping of knee extension in the stance phase for smooth, natural movement of the knee joint

4. Swing phase flexion angle

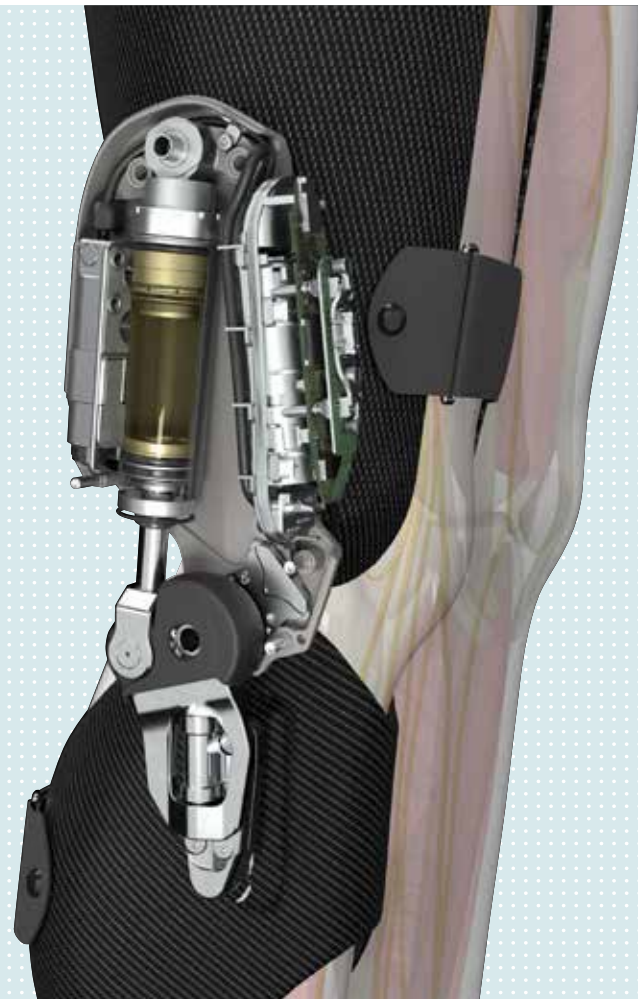
Controls the end of swing phase flexion for an optimized gait pattern

5. Swing phase extension damping

Final swing phase extension damping for softer braking when user is changing walking speeds



A look inside the joint

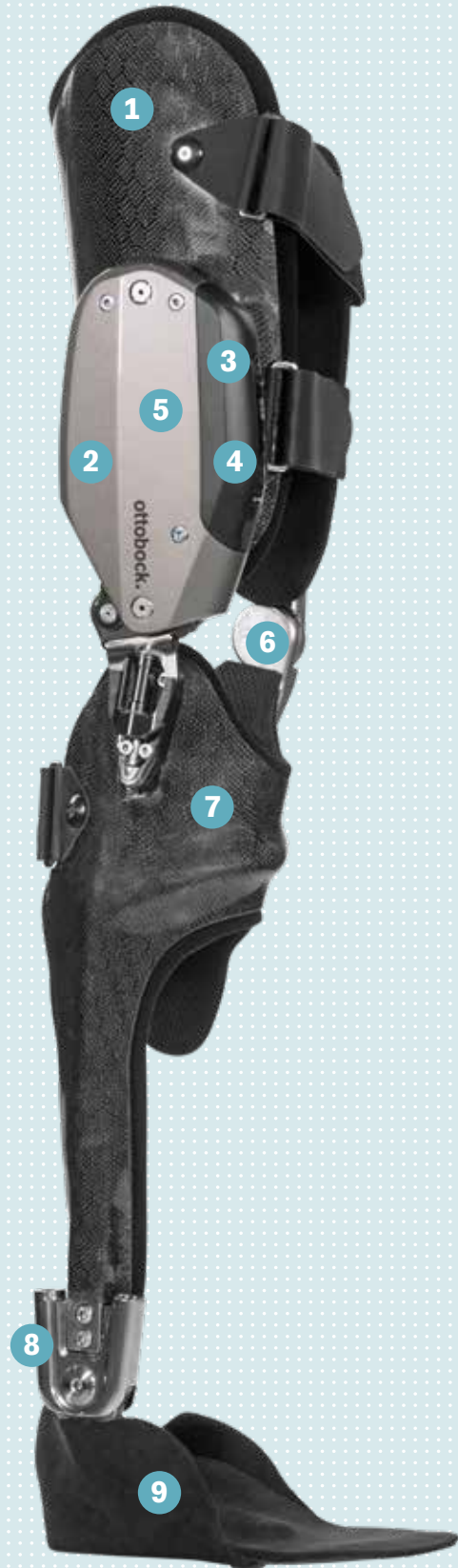


Video
How the C-Brace[®] orthotronic mobility system works



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The components



- 1 Thigh shell**
Custom thigh shell made of fiber composite material
- 2 C-Brace hydraulic joint unit**
- 3 Display**
Shows the system's status and battery charge level
- 4 Microprocessor**
The microprocessor receives and processes sensor signals, and controls walking with the C-Brace in real-time
- 5 3D sensor**
The 3D sensor in the joint unit measures the current position of the joint every 0.01 seconds
- 6 Medial support**
17KF100=* in four versions
- 7 Lower leg shell**
Custom fabricated lower leg shell made of fiber composite material
- 8 Ankle joint**
Bilateral fitting:
17LA3N=16-T (< 187 lbs.)
17AD100=16-T (≤ 187 lbs.)
17LA3N=20-T (< 242 lbs.)
17AD100=20-T (≤ 242 lbs.)
17AO100=22-T (≤ 275 lbs.)

Unilateral fitting:
17AO100=22-T (≤ 242 lbs)
- 9 Foot component**
Custom fabricated foot component made of fiber composite material



The Setup app

Use a tablet to program individual settings for the user



Seizing new opportunities

Indications

The C-Brace may be considered for patients with all neurologic conditions resulting in paresis or paralysis of the knee extensors, or orthopedic conditions in which the quadriceps fail to keep the knee extended during stance phase who do not present any of the contraindications.

The leading indications are incomplete paraplegia with very minor or no spasticity, as well as post-polio syndrome, the condition following poliomyelitis.

Other factors to consider:

- The patient must be able to fully stabilize their torso.
- The muscle strength of their hip extensors and flexors must permit controlled swing-through of the affected leg.
- Compensatory hip movement is permissible.
- The patient must fulfill the physical and mental requirements for perceiving optical/acoustic signals and/or mechanical vibrations.

Contraindications

- Inability to advance the limb through compensatory motion or grade 3 hip flexor
- Insufficient trunk stability
- Moderate to severe spasticity
- A flexion contraction of more than 10° in the knee and/or hip joint
- Genu varus/valgus of more than 10° that cannot be corrected
- Body weight > 275 lbs.
- Leg length discrepancy > 6 in.

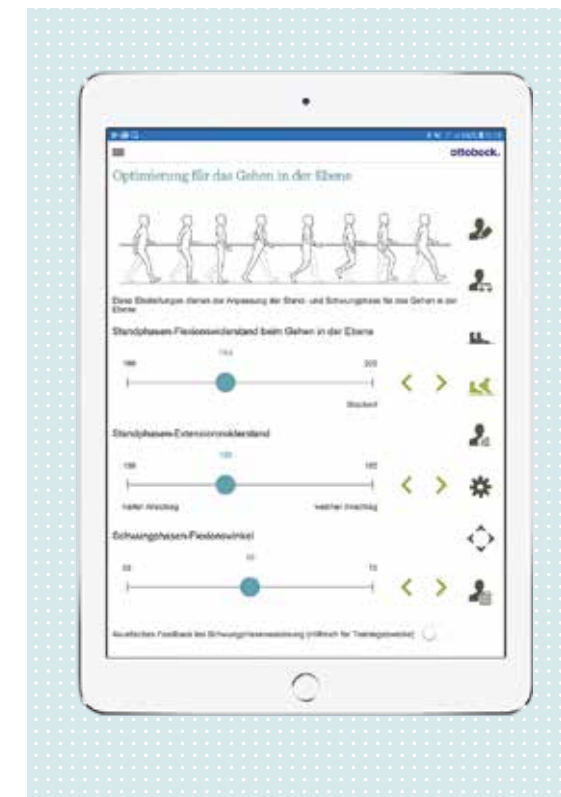
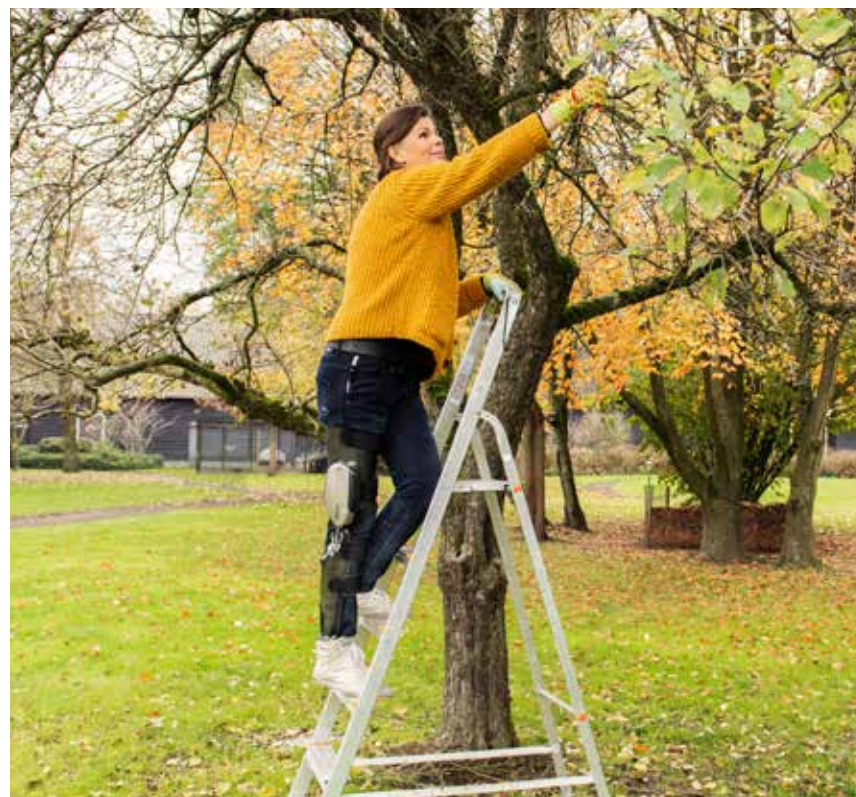
C-Brace – new opportunities for Orthotists

With the C-Brace, users have more freedom in their movements than ever before.

Orthotists are able to fabricate the C-Brace themselves for the first time.* Ottobock provides the individual components and tools. The orthosis is then fabricated on-site by the technician using wet lamination. Certification is required and practical training for fabricating, adapting, and fitting the orthosis system is provided in the course of this certification. Accompanying physical therapy is part of the integrated fitting process, as well.

C-Brace – easy to adjust

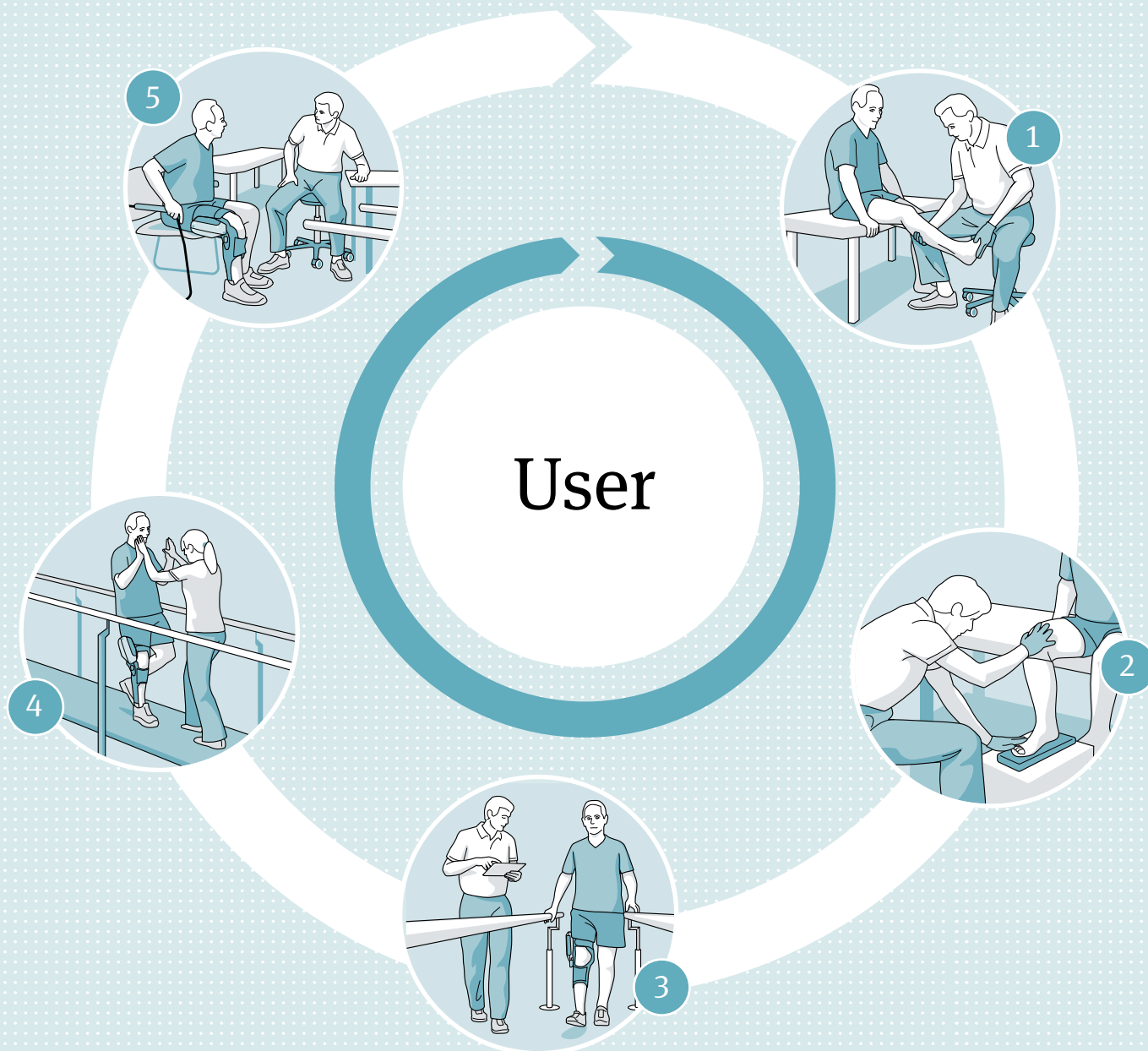
The Setup app makes life easy for you as the O&P professional. Simply configure the optimum settings for the user on a tablet.



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Treatment process



From the examination to quality control

A fitting with the C-Brace requires five steps. The time required varies depending on the user, but usually extends throughout several weeks. From the initial examination to gait training and finally, regular quality control – a comprehensive, custom fitting is essential to ensure the user reaps the full benefits of the C-Brace.

1 Examination and fitting

Before a final recommendation can be made, you as the O&P professional need to evaluate whether the C-Brace is suitable for the user. Ottobock provides a diagnostic trial tool to assist with this process and help determine if the user is a C-Brace candidate.

2 Measuring and production

You take the user's measurements, fabricate the plaster negative and positive, and initially produce a test orthosis. This is followed by fabrication of the definitive orthosis using prepreg technology or with Orthopox epoxy resin. Ottobock's Fabrication Services team can also perform this for you, for an additional fee.

3 Fitting and adjustment

A fitting of the C-Brace definitive orthosis is now performed. Use the Setup app to configure the system according to the user's needs. You can also configure a second mode, which allows activities such as cycling.

4 Gait training and rehabilitation

Training with the C-Brace is an important element of the fitting process. The objectives of the trained physical therapists are to teach the user how to use the system, build confidence in the C-Brace (load transfer), and to practice the functions that are new to the user.

5 Service and clinical follow up

Ottobock recommends service inspections every two years for the C-Brace joint unit, and continuous follow up by the Orthotist for settings and fit during the life of the product.



Warranty and service

Ottobock offers a standard three-year warranty with the purchase of a C-Brace.

For an additional cost, the warranty can be extended.

Complying with the established maintenance intervals is required to maintain the warranty.

Patient selection aid for the C-Brace®

The selection aid helps determine whether a patient is suitable for the C-Brace. However, this document should be considered only an aid. For the final decision, please fit the patient with the diagnostic trial tool.

Cognitive requirements

The patient must be capable of ensuring the proper handling, care, and use of the orthosis (e.g. charging the battery, using the Cockpit app, etc.).

Functional deficit

Neuromuscular or orthopaedic instability of the knee joint in the sagittal plane
Diagnosis (by the physician):

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Exclusion criteria

If any of the following apply to your patient, he or she cannot be fitted with a C-Brace at this time:

- Swing phase initiation from a standing position is not possible**
- Weight over 275 lbs**
- Severe spasticity**
- Leg shortened more than 6 inches**
- Knee or hip flexion contracture more than 10°**
- Insufficient neuromuscular trunk stability for the trial phase**
- Diseases that preclude the use of an orthosis (e.g. uncontrolled edema, extensive skin irritation)**
- Orthoprosthesis**



