ottobock.

C-Brace®.

You'll always remember your first step.

Information for practitioners

C-Brace® – Orthotics reinvented

With the C-Brace®, Ottobock is changing the way of thinking in orthotics. In conjunction with your skill as an orthotist, this innovative orthosis system opens up astounding possibilities:

In the past, paralysis orthosis fittings for the lower limbs have been severely limited. No matter which system you as the orthotist selected: the only function was releasing and locking the knee joint. The C-Brace® orthotronic mobility system is a new generation that can do much more.

As the first mechatronic SSCO®* system in the world, it controls both the stance and the swing phase with unique sensor technology.

For the user, it therefore sets previously unimagined standards for mobility and reliability. For you as the orthotist, the C-Brace® presents interesting new challenges and offers incentives to blaze new trails in your profession.

***S**tance and **S**wing Phase **C**ontrol **O**rthosis

Christin K., incomplete paraplegia, after therapy and 4 years using a wheelchair she is now full of life.

Key features at a glance:

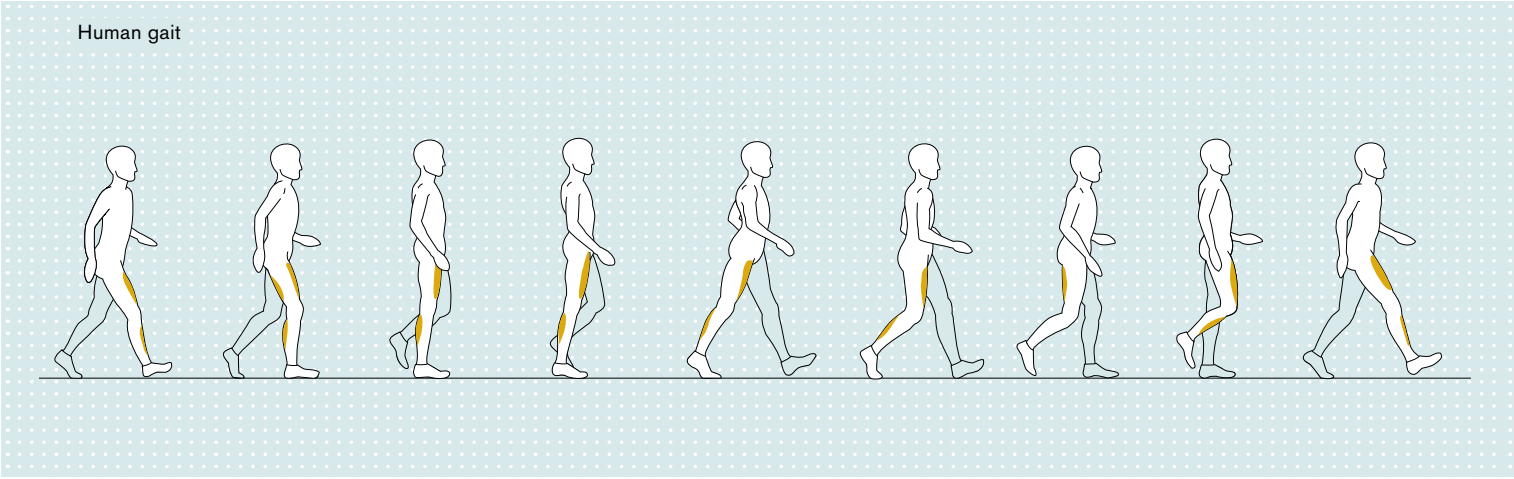
- One-of-a-kind SSCO® system
- Microprocessor-controlled stance and swing phase
- Entire gait cycle can be controlled dynamically and in real time
- System responds quickly to any situation
- Flexion under load, such as while sitting down, is possible
- Walking down stairs step-over-step is possible
- Walking on slopes and uneven surfaces becomes much easier and safer
- Enables a variety of activities such as cycling and inline skating
- Individual operating modes can be set by the technician and selected by the patient, depending on the situation
- Natural body posture helps reduce one-sided physical strain and resulting problems
- Potential for reduced effort, for example when compared to locked systems
- Newfound mobility and a greater feeling of safety for significantly enhanced quality of life

C-Brace® –
Walking recalculated

The orthotronic mobility system includes custom fabricated thigh, calf, and foot components. A sensor-integrated, dynamic fibre composite spring connects the foot to the calf. An ankle moment sensor transmits signals to the microprocessor-controlled hydraulic knee joint unit, which is integrated into a carbon fibre frame along with the electronics. In addition, a knee angle sensor continuously measures the flexion of the knee joint and its angular velocity. The system recognises the phase of the gait cycle that the user is in. The hydraulic resistances are regulated based on the phase of gait, thus controlling flexion and extension. Thanks to ongoing calculations, the C-Brace® can even optimise the gait pattern in each individual phase.

The vastness of the region,
the freedom of thought…
letting yourself fall in the moment,
those are things I am thankful for.

The 8 phases of walking – and what the C-Brace® does differently:



1. Initial contact

2. Load response

3. Mid-stance phase

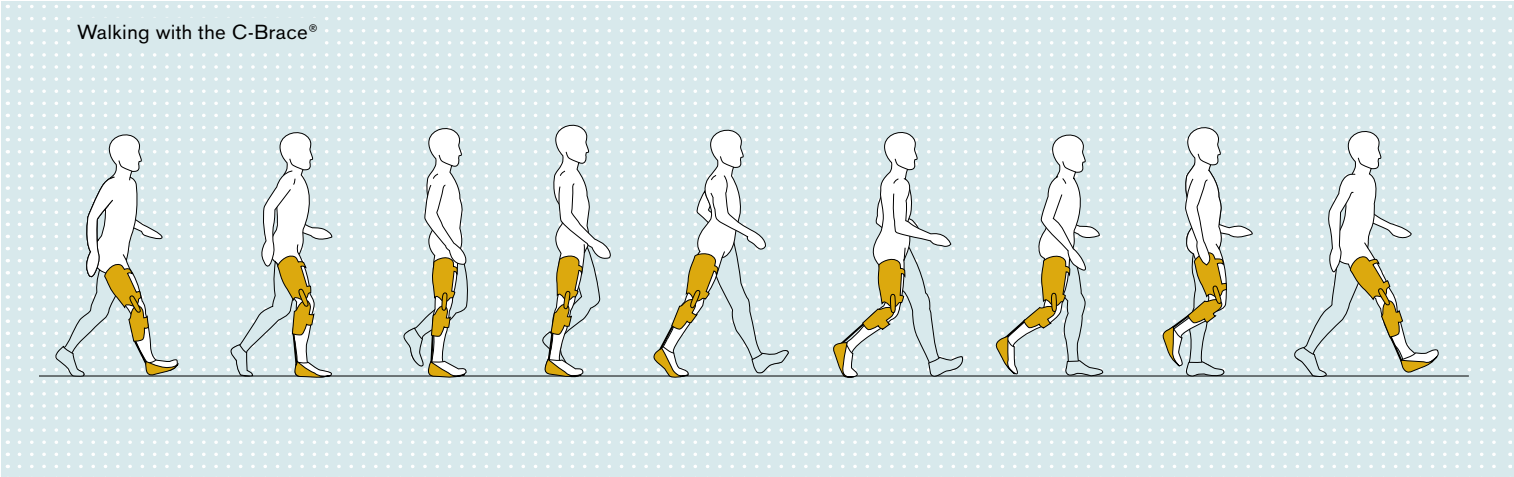
4. Terminal stance phase

5. Pre-swing phase

6. Initial swing phase

7. Mid-swing phase

8. Terminal swing phase



1. Stance phase flexion damping: controlled stance phase damping supports the knee extending musculature upon heel strike

2. Stance phase flexion damping plus/time: additional damping option that supports the musculature as needed upon increased load transfer. Time limit on additional stance phase damping

3. Stance phase extension damping: knee extension damping in the stance phase for a natural, smooth movement of the knee joint

4. Maximum load: definition of the safe switching point to trigger the swing phase

5. Swing phase initial flexion damping: switching to minimum resistance for optimum initiation of the swing phase

6. Swing phase knee angle threshold/ swing phase dynamic factor: controls the end of swing phase flexion for an optimised gait pattern

7. Extension resistance: switching to minimum resistance during swing phase extension

8. Swing phase extension damping: final swing phase extension damping for a soft braking movement at changing walking speeds

The individual adaptation of the C-Brace® by you as the orthotist is of particular importance in order to provide optimum support for the user in each phase of the gait cycle.

C-Brace® – what's inside:

Thigh shell
Individually fabricated thigh shell made of fibre-reinforced prepreg guarantees maximum stability with minimum weight.

Battery
Integrated Li-Ion battery.

C-Brace® joint unit

Control buttons
The integrated control buttons are used to select the desired mode.

Knee angle sensor
The knee angle sensor in the joint axis measures the current position of the joint every 0.02 seconds.

Microprocessor
The microprocessor receives and processes sensor signals and controls walking with the C-Brace® in real time.

Lower leg shell
Lower leg shell made of fibre-reinforced prepreg, with clamp adapter for the spring element.

Spring element
Carbon or fibreglass spring with integrated ankle moment sensor.

Foot component
Foot component fibre-reinforced prepreg with clamp adapter for the spring element.

"Meeting people, networking, taking part in social life. I am a very open person and need that."

C-Brace® –
Seizing new opportunities

Indications

In principle, the orthotronic mobility system can be considered for all neurological indications of the lower limbs.

The primary indications include:

- Lower limb involvement with weakness or paresis of the quadriceps muscle or the inability to maintain knee extension during stance phase e.g. incomplete paraplegia with segmental levels of L1 to L5 or polio, post-polio syndrome

Contraindications

- Moderate to severe lower limb spasticity
- Hip flexor strength of less than grade 3. Ability to advance the limb by compensatory trunk movement (the closer to grade 3 the better) is permitted
- Inability to perform reciprocal gait in the presence of less than Grade 3 Hip Extensors
- Knee valgus greater than 10 degrees beyond anatomic neutral
- Knee varus less than 2 degrees of relative ankle dorsiflexion
- Hip or knee flexion contracture greater than 10 degrees
- Body weight over 125 kg/275 lbs

C-Brace® – development of the occupational profile

The passage of time and advancement of technology naturally also means there will be new challenges. This applies equally to orthotics. The introduction of the C-Brace® orthotronic mobility system means the occupational image of the orthotist will develop as well: some activities will be eliminated while other, new tasks are being added. In the course of Ottobock certification, we will gladly explain the details to you in person. This is the only way to ensure that your patients can reap the full benefits of the new C-Brace® without restrictions.
Only this framework provides sufficient leeway to illuminate all of the technical details and examine the process steps in detail.

Patient fittings cannot be provided without certification.

C-Brace® – new individuality at a click of the mouse:

Sophisticated software (C-Soft 2.6.) makes it easy for you as the orthotist to find the optimum settings for every patient:
Special emphasis was placed on making the programme with its interface and menus easy to understand and user-friendly. It guides you through various stages step-by-step while analysing each gait phase via Bluetooth®.

Warranty and Service

Ottobock offers a standard three-year warranty on the C-Brace® orthotronic mobility system. The warranty can be extended if desired. A service inspection must be performed by Ottobock every 12 months in order to maintain the warranty.

Control over my own life. Walking down new roads – or driving.

This is very important to me.

Please contact us if you have any further questions or would like more information.

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