

ottobock.

The C-Brace[®]

Step into your future.[™]

Quality for life

Information for users

Explore ...

... a number of different stories about the life-changing C-Brace.

The C-Brace is a microprocessor-controlled leg orthosis that responds to everyday movement and situations in real-time. This helps ensure the safety, stability, and confidence in users everyday lives.

The C-Brace allows users with paralysis in their legs to go up and down slopes and inclines, walk on uneven terrain, and go down the stairs one foot at a time, step-over step. C-Brace users can enjoy

activities with their families and friends, and experience life in a completely new way.

The people you will meet in this brochure are sharing their stories and experiences with this incredible technology, and the newfound opportunities they have to live their lives to the fullest.

Discover ...

... the benefits of the C-Brace.

- Walking requires less physical exertion
- The need for compensating movements is reduced, improving body posture and reducing subsequent damage
- Increased safety compared to conventional leg orthoses
- Controlled walking, even on uneven ground and slopes
- Walking down stairs step-over-step
- Sitting down in a controlled, fluid movement
- High-performance battery lasts all day, when fully charged
- Notification sound indicates the battery is too low and automatic safety mode is activated
- User-defined mode can be selected via a smartphone app, e.g. for cycling



Marjan, the Netherlands

Marjan has incomplete paraplegia as a result of various cancer treatment operations.



Indication

The C-Brace is an option for people with neurological indications in their lower limbs. The leading indications are incomplete paraplegia (lesion between L1 and L5) with very minor or no spasticity, as well as post-polio syndrome, a condition that can follow poliomyelitis.

Giving up wasn't an option

The diagnosis was shocking: cancer. Doctors gave Marjan three months to live. “They said I’d never see my children grow up. I would never become a grandmother. I couldn’t accept that.” Marjan chose to fight – and won, thanks to the support of her husband, Bert. “I could have never done it without him.” After a number of different operations, she had defeated cancer. However, Marjan couldn’t walk anymore. For two years, she had to use a wheelchair. “Not being able to walk wasn’t an option, but there wasn’t any way out. Then came the C-Brace.” It was a breakthrough. Marjan learned to walk again with the C-Brace and she can dance, ride a bicycle, and have fun playing with her granddaughter. “She calls me Robo-Nan. Zelin thinks it’s quite cool her grandma uses something like this,” says Marjan, who’s from the Netherlands. “You can’t give up. You have to fight and keep looking for new options.” And Marjan has found hers. “Since I got the C-Brace, I finally have my life back.”



“There’s still so much to experience; giving up wasn’t an option.”



I can't sit still

Denise was 29 years old and in the prime of her life when what should have been a straightforward intervertebral disc operation went wrong. When she woke up, she couldn't feel her thigh anymore. One of her legs remains paralyzed. It was an existential crisis that she overcame thanks to her irrepressible determination.

And with the help of Mark, who was first her physiotherapist and today her fiancé. He was impressed by the strength shown by the mother of two, who had separated from her husband shortly before her operation. The pair became increasingly close and Denise regained her freedom bit by bit, thanks to the C-Brace as well. Her efforts were successful. Today, she's equally active on the playground and in the pool. She climbs mountains, scaled the Eiffel Tower, and can keep up with her sons.

"My C-Brace is like a pair of glasses for me now. I can't see without my glasses, and I can't walk without my C-Brace."



Denise, Germany
Incomplete paraplegia after failed disc surgery.



"The C-Brace gave me back the freedom to choose for myself what I still want to achieve."





David, US
Paralyzed in both legs due to a spine injury.

The C-Brace changed everything

David was a soldier in the US Marines when a bomb exploded right next to him, while on a mission. It was a blow that affected him physically, as well as mentally. He has been paralyzed in both legs since then, and used a wheelchair for seven years. “I have been down the darkest part of the road, to make the final decision to not want to live anymore,” David says today. “He had given up,” affirms his father, Bruce. The 70 year old always stayed close to his son’s side, motivating and supporting him.

Then everything changed. “I’ll never forget how David put the C-Brace on for the first time and he walked right down the hall,” Bruce recalls. “The C-Brace changed everything,” says David, who is now the proud father of five children. “I used to serve my country, and now I serve my family.”

*“I don’t think I’m handicapped.
I think I’m very handicapable.”*





David, Germany

David's left leg was paralyzed in a motorcycle accident.

Back in the swing of things

David had to work hard to get back to his normal everyday life. A student who loved being active, he had a severe motorcycle accident in 2016. His left leg has been completely paralyzed from the hip down ever since. "Before, I didn't want to accept help, but now I have to and I can cope with it much better," he says.

It was hard at first, but David fought his way back. His first orthosis let him get around without walking aids at home, but not outside. "I was always completely exhausted at the end of the day. Walking on cobblestones was a challenge, and walking on bumpy paths in the forest was completely impossible." Things are different today. David now goes hiking with his brother on a regular basis and plays sports, too. Activities that seemed impossible are part of his everyday life now.



"Walking with the C-Brace is a giant leap forward for me."



You have to give new technology a chance

Melvin had polio, or infantile paralysis. His left leg was weaker from the start, but that didn't stop him from playing sports, even as a child. He started swimming at the age of ten and attended Paralympic youth camps, first as a participant and later as a coach.

"It's extremely important to avoid putting too much strain on your body when you have polio. Otherwise, you lose muscle mass and can't build it up again." Then Melvin became one of the first people in the world to use the C-Brace. The new orthosis significantly reduced the strain on his body. Melvin, who works as a systems technician, could suddenly walk much longer and farther. It was a completely new feeling that impressed him the very first time he tried the C-Brace. Thanks to the new device, he realized he could even walk backward again. He still smiles when he thinks about it.



Melvin, Germany

Melvin's left leg became paralyzed after he had polio as a child.



"For me, the biggest step forward was taking a step backward."





Hannah, US

Hannah's right leg was paralyzed following a failed operation.

The C-Brace gives you freedom

The mother of two sustained nerve damage in her spinal cord during a routine operation. One of her legs was left paralyzed. "The time just after the operation was the most difficult period of my life. I was in a wheelchair and the doctors predicted that things would stay that way. I was pregnant, and my future life felt like an insurmountable obstacle." The young woman didn't know where to turn. "You're dependent on other people and every movement is difficult, of course." Hannah wore a locked orthosis at the time, which was already an improvement compared to the wheelchair. But, she wasn't independent in her day-to-day life anymore. For Hannah, the C-Brace means more than just being able to walk up and down inclines or on uneven surfaces. "The C-Brace gave me back my freedom. I can take care of my children and myself again, and I'm very grateful for that."



"The C-Brace gave me back my freedom."

The C-Brace is part of me

Wolfgang was eight when he contracted infantile paralysis, or polio. He subsequently had post-polio syndrome as well. “Prior to that, I could still walk sometimes and ride a bike as well, but that wasn’t possible afterwards.” The next period of his life was dominated by the fear of falling – several severe fractures and numerous hospital stays attest to this.

The C-Brace changed Wolfgang’s life immensely. “I learned how to walk again, something I had been able to do when I was eight.” The fact he rarely thinks about his orthosis anymore feels like a gift to him. It’s simply there for him.

“I like putting it on in the morning and taking it off again at night. I ride again occasionally, I go biking and do Nordic walking and yoga. When I think about it, I don’t really feel that I have a disability anymore.”



Wolfgang, Germany

Wolfgang had polio as a child and post-polio syndrome as an adult, which resulted in his right leg being paralyzed.



“I know I’m on my way.”

Thigh shell
Custom fabricated

C-Brace joint unit
With integrated Li-Ion battery
and microprocessor

Display
View system information

Microprocessor
Controls walking in real-time

Lower leg shell
Custom fabricated

Ankle joint
Can be combined with
various ankle joints

Foot component
Custom fabricated



The Cockpit app

**Information and mode
setting available via
smartphone**



C-Brace animation

Scan the QR code to see
how the C-Brace works
and what happens in the
joint unit!



What the C-Brace enables

SSCO® (Stance and Swing Phase Control Orthosis) is the secret behind the C-Brace. It means the orthosis controls both the swing and stance phase during the gait cycle. C-Brace is the world's first SSCO.

The sensors in the C-Brace joint unit are constantly monitoring the user's movements. The system analyzes this 100 times per second.

This information is passed on to the microprocessor in the C-Brace, which regulates the required support.

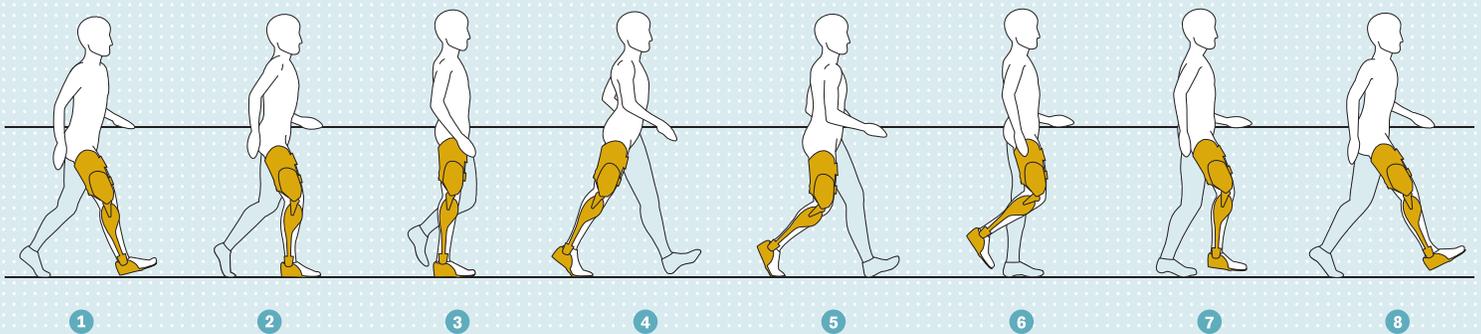
Whether you're walking quickly or slowly, or what position your leg is in at the time, the C-Brace adapts to changing situations.

1-4 Stepping down and rolling over

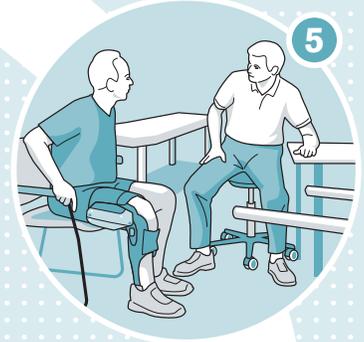
As with natural gait, the knee does not maintain full extension after the heel hits the ground. The orthosis damping results in a smooth rollover movement. Finally, the orthosis switches shortly before the toes leave the ground.

5-8 Swinging forward and stepping down

The orthosis resistance in the knee joint is now minimal. This allows the leg to swing forward with the help of a slight movement from the hip. In the final phase of a step, the C-Brace gently dampens the movement, even at changing walking speeds.



The C-Brace Process



1 Examination and fitting recommendation

Before deciding whether the C-Brace is suitable for you, the orthotist performs some tests. With the help of the diagnostic trial orthosis, you work together to find out if you can use the C-Brace.

2 Trial and fabrication

Once the orthotist determines the C-Brace will work for you, plaster casts of your leg(s) are made. You will then be fit with a test orthosis, followed by the final fitting of your C-Brace. Casting and test orthosis fitting are essential to the fabrication process to ensure a proper fit of your customized C-Brace.

3 Fitting and adjustment

The orthotist adapts the C-Brace to your requirements with the help of the Setup app. If desired, the orthotist configures a second mode that allows activities such as cycling.

4 Training and rehabilitation

You gradually learn how to use the C-Brace by working with a trained physical therapist.

5 Quality and service

Ottobock regularly performs a mandatory service inspection. Your orthotist checks the fit and settings at the same time.

Your path to the C-Brace

Fitting

Your certified orthotist is your primary point of contact. He or she will work with you to determine whether the C-Brace is right for you.

The initial test is conducted while you wear the diagnostic trial orthosis. It isn't as comfortable as your final orthosis, but it gives you an initial impression of what it's like to walk with the C-Brace. Once you have decided on the C-Brace, your custom orthosis is fabricated. You then learn how to use the C-Brace.



The diagnostic trial orthosis: This tool confirms whether or not you are a candidate for the C-Brace, and let's you get an initial feel for the new movements you will experience.

Therapy

Therapy begins with a consultation. Your therapist will want to know more about your medical history, your social and work environment, and what you want to accomplish with the C-Brace.

Your therapist will also examine your physical conditions: muscle functions, balance, and mobility. After you receive your C-Brace, the therapist will spend even more time with you.

This is when intensive training begins. The therapist helps you become familiar with the functions of the C-Brace and use it to your full potential.



A team: Working closely with your orthotist and physical therapist helps you make the most of your C-Brace.



Online tutorials

Scan the QR code for online tutorials showing therapeutic exercises.



C-Brace questions and answers

1. Are there physical requirements to be able to use the C-Brace?

The C-Brace is intended for adolescents and adults, and is approved for a body weight of up to 275 lbs.

2. What does the C-Brace offer compared to other KAFOs?

The range of motion is expanded. You can walk down stairs with natural movement patterns, walk down a ramp, and sit down without dropping into the seat. Because the C-Brace controls the entire gait cycle dynamically, safety is also improved, which means you are less likely to stumble. Physical strain is reduced, especially when one side of the body is not affected and was used for compensatory movements. This can reduce damage caused by excessive unilateral strain.

3. Do the size and weight of the orthosis have a detrimental impact on the gait pattern?

No, there are no noticeable limitations. It's true the orthosis is heavier than other KAFOs, but this is less noticeable since walking is more efficient.

4. How has the C-Brace made walking different?

Safety while walking is improved because the C-Brace controls walking in real-time and responds quickly. Your movements become smoother and more natural.

5. Can I wear the orthosis over pants?

Yes, however, the pants should fit closely to avoid wrinkles, which can lead to pressure sores. We recommend wearing the C-Brace directly on your skin.

6. Can I operate a vehicle with the C-Brace?

The respective national legal regulations determine whether or not you can operate a vehicle with an orthosis. Always check these regulations in advance. The leg with the orthosis may not be used to control the vehicle (e.g. operate the accelerator and brake pedals). Specialized garages can retrofit the vehicle if required and adapt it to your needs (e.g. hand controls for the brake and accelerator).

7. Do I have to wear special footwear or always use the same shoes?

You can wear any type of shoe. However, the orthotist adjusts the C-Brace for one heel height, and you should then maintain that. You may have to wear shoes that are a size larger in order to leave sufficient room for the foot component.

A comfortable, wide, low shoe with laces or hook-and-loop closures makes it easier to use the C-Brace.

8. Can I use the orthosis without footwear?

No, because the risk of slipping with the foot component is too high. This would also change the heel height.

9. Is the C-Brace waterproof?

The C-Brace is water resistant, but not waterproof. Meaning, you cannot shower, bathe, or swim wearing the orthosis, but will be okay if you get caught in the rain. Additionally, the C-Brace should not be exposed to salt water. Ottobock has waterproof orthoses available for use in the shower or bath, or while at the pool or beach. For more information on Ottobock's waterproof orthoses, please contact your orthotist.

10. Can I be outside in the rain?

The C-Brace is protected against splashed water, so being out in the rain is generally not a problem.

11. What happens when the battery is drained completely? Can I continue walking?

A notification sound promptly warns you when the battery is low. The C-Brace then enters a safety mode. It maintains a certain level of damping, which you and the technician establish in advance. You can therefore continue using the C-Brace, but not with the usual dynamics.

12. Does the C-Brace allow any other potential uses?

Your orthotist can configure a user-defined mode for you. It allows activities such as cycling. The C-Brace also recognizes when you are sitting and reduces the damping so you can sit comfortably.

13. How can I switch to the user-defined mode?

You can use the smartphone app to do this. The Cockpit app for users is available free of charge for iOS and Android operating systems in the respective app store.

14. What do I do if there is a defect?

The system automatically switches to safety mode (see question 11). Please contact the orthotist who fit your C-Brace.

15. How does the C-Brace indicate possible errors?

Malfunctions are indicated by an acoustic and visual signal. Please contact your orthotist in this case.

16. What happens during service appointments?

You will visit your orthotist regularly for a service appointment. They send the joint and charging cable of the C-Brace to Ottobock for inspection.

17. Is there anything I should keep in mind when storing and charging the orthosis?

The orthosis should be kept still and in a secure position during storage and charging. We recommend charging on a daily basis, like you would your cell phone.

18. Does the C-Brace technology work in various climates?

In general, yes. However, the relative humidity must not exceed 93%, and the temperature has to be between 14 and 104 °F.

