

# Free Walk

Secure stance phase – lightweight and discreet



Quality for life



A vertical photograph showing a field of tall grass in the foreground and a dense line of trees in the background under a bright sky.

# Free Walk orthosis

The Free Walk orthosis allows patients with neurological deficiencies to gain new confidence while walking, even when the partial failure of musculature makes the independent stabilisation of the knee joint in the AP direction impossible.

The fact that the orthosis joint is locked during the stance phase and unlocked during the swing-through phase results in a natural gait pattern. The patient can bend the leg and requires less energy while walking. The light and stable Free Walk orthosis also lightens the load on the back, hips and knee joint through its mode of operation. It is easy to apply and hardly noticeably under clothing.

#### **New:**

The new ankle joint simplifies fine adjustment on the patient. Since the angle between the ankle joint and foot stirrup is continuously adjustable, the Free Walk's function is easy to optimise. A scale on the foot stirrup makes the adjustment reproducible. The foot stirrup offers additional height adjustment.

#### **Optional accessories which can be retrofitted expand the range of indications:**

The medial support (170D30) is intended for patients with a valgus deviation of more than 10° (up to 15°). The triple control (170D50) allows the user to select between the “free moving”, “locked” and “Free Walk” functions.

# Indications for the fitting with a Free Walk

Treatment with the Free Walk orthosis is indicated for pareses or paralysees of muscles and muscle groups of the lower extremities. These may develop within the scope of the following underlying diseases:

## **Central nervous system disorders:**

- Condition following a stroke
- Condition following brain tumours
- Condition following encephalitis/brain abscesses
- Condition following serious craniocerebral trauma (CCT)
- Multiple sclerosis
- Ataxia in the context of diseases involving the cerebellum (sporadic delayed atrophy of the cerebellar cortex, cerebellar ataxia)

## **Spinal cord diseases:**

- Condition after spinal cord injury (e.g., incomplete paraplegia)
- Incomplete hemispinal cord syndrome (Brown-Séquard syndrome)
- Condition following spinal cord tumours and spinal meninges tumours
- Condition following transverse myelitis, abscesses
- Progressive spastic spinal paralysis (Erb-Charcot-Strümpell)
- Myatrophic lateral sclerosis (ALS)
- Progressive spinal muscular atrophy
- Condition following acute poliomyelitis
- Post-polio syndrome
- Degenerative diseases (e.g. spinal canal stenosis, stenosis of the intervertebral foramina, spondylolisthesis)
- Abnormality of the spinal cord (for example vertebral arch defects with spondylolisthesis, spina bifida aperta, meningocele, myelomeningocele)
- Funicular myelosis
- Syringomyelia
- Neural muscular atrophy
- Anterior spinal artery syndrome

## **Affection of the muscles (myopathies):**

- Progressive muscular dystrophy
- Condition following polymyositis/dermatomyositis
- Other myopathies (also in the context of other underlying diseases such as Cushing's myopathy)

## **Diseases affecting the peripheral nervous system:**

- Radicular syndromes (e.g., condition following hernia of the intervertebral disk, radiculitis and poly(neuro)radiculitis, Guillain-Barré Syndrome)
- Condition following lesions of the lumbar and sacral plexuses
- Peripheral nerve lesions (e.g., femoral nerve, sciatic nerve, tibial nerve, obturator nerve, superior and inferior gluteal nerves)
- Polyneuropathy (e.g. asymmetrical diabetic polyneuropathy, alcoholic neuropathy, parainfectious and paraneoplastic polyneuropathy)

# Free Walk orthosis

## Function and therapeutic benefits

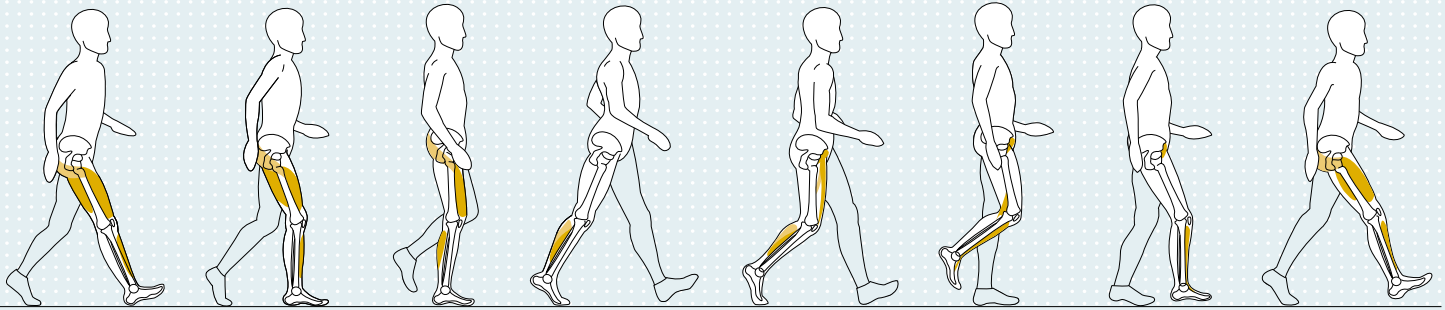


The Free Walk orthosis allows patients to develop a smooth and nearly physiological gait pattern. At the same time, it assures a secure and stable stance for the patient. A special system controls the orthosis knee joint via the upper ankle joint and the connected insole in the foot area. The orthosis system automatically unlocks when the patient extends the knee shortly before toe-off and causes dorsal flexion of the upper ankle joint. The user can then bend the leg and swing through freely. During extension of the knee prior to heel impact, the orthosis joint locks automatically. This results in secure impact and a stable stance for the patient. The Free Walk also features a manual unlock function, used while sitting for example. In this manner, the Free Walk orthosis offers patients with paresis or paralysis in particular more mobility in the lower extremities.

There are many therapeutic benefits for paralysis patients: Contractures and joint damage caused by immobilisation are prevented, muscular atrophy is reduced. Cardiovascular capacity for everyday activities is maintained. In case of central nervous system disorders, the assumption of functions by unaffected brain regions (motor re-learning, cortical reorganisation) can be promoted. This is how the Free Walk orthosis supports the social and professional (re-) integration of the patient.

# Gait Cycle

## Human gait phases



### Initial Contact

- Beginning of the stance phase with heel contact
- 0 % of the gait cycle

### Load Response

- Weight transfer, shock absorption through knee flexion, maintenance of forward motion
- 0-12 % of the gait cycle

### Mid Stance

- Forward motion of the body over the stationary foot, start of knee extension
- 12-31 % of the gait cycle

### Terminal Stance

- Forward motion of the body over the forefoot
- 31-50 % of the gait cycle

### Pre Swing

- Preparation of the swing phase, knee flexion has been initiated
- 50-60 % of the gait cycle

### Initial Swing

- Toe-off and forward swing of the leg, achieving maximum knee flexion
- 60-75 % of the gait cycle

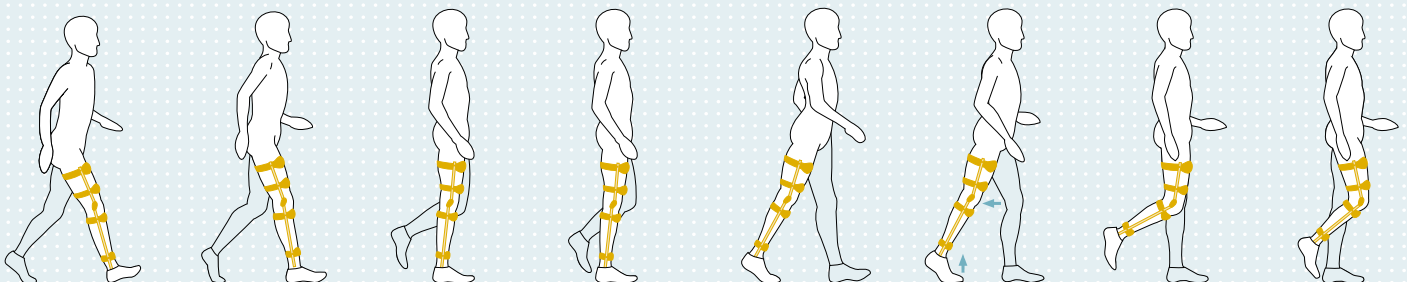
### Mid Swing

- Continued forward swing of the leg, knee extension
- 75-87 % of the gait cycle

### Terminal Swing

- Braking the forward swing, preparation for the next step
- 87-100 % of the gait cycle

## Gait cycle with Free Walk



Heel strike with stabilised knee joint.

Leg with Free Walk orthosis assumes the load and the knee joint is stabilised.

Mid-stance phase with locked knee joint.

Heel strike with the contralateral foot.

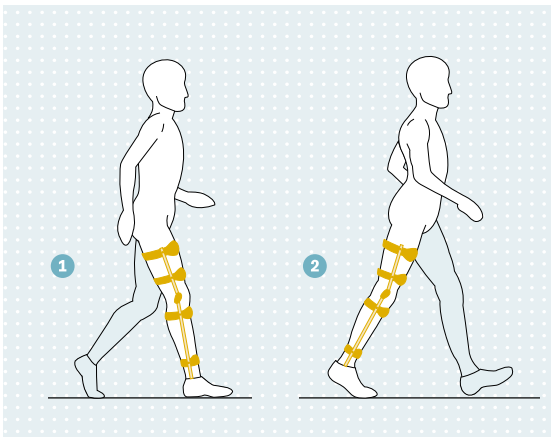
The body moves in front of the foot with complete extension of the knee joint. The lock is released when the toes are lifted from the ground (toe-off).

Pre-swing phase: the leg is unloaded, the leg fitted with the Free Walk orthosis can swing through with the lock released.

# Functional principle

In contrast to the gait cycle of a healthy person, the knee joint of patients lacking functionality of the knee stabilising musculature must be stabilised by an orthosis. The Free Walk orthosis provides stability only in the phase where it is required. The swing-through phase is not compromised.

Between heel contact and toe-off, i.e. when the foot bears weight on the ground, the Free Walk orthosis stabilises the knee joint and supports the knee stabilising musculature. The orthosis remains locked during the entire stance phase. Only between the terminal stance phase and the pre-swing-through phase is the orthosis knee joint unlocked for the swing-through phase.



## 1 Security in the stance phase:

The orthosis knee joint automatically locks when the knee is extended before heel impact. The patient can stand securely and put weight on the leg during the stance phase. The Free Walk thus fulfils the functions of a locked orthosis.

## 2 Unlocking in the swing-through phase:

The patient unlocks the orthosis knee joint by extending his or her knee shortly before toe-off and allowing dorsal flexion of the upper ankle joint. The user can then bend the leg and swing through freely.

## Advantages over conventional orthoses

Due to the low weight and the functionality of the Free Walk orthosis, the moments of force acting on both knee joints are significantly reduced. This lowers mechanical strain and reduces the risk of arthrosis.

Gait analyses have shown that a patient with Free Walk needs less oxygen and thus expends less energy. This creates cardiovascular reserves for greater physical performance.

- Free Walk is lightweight
- Secure in the stance phases, as with locked orthoses
- Mobile in the swing-through phase, by unlocking the orthosis knee joint (patient develops a nearly physiological gait pattern)
- Easy to put on and take off with the frontal pads and handy quick-release closures
- Comfortable sitting thanks to flexible straps
- No medial joint interferes when sitting or walking
- Cosmetically inconspicuous
- Reduces the formation of pressure sores as a result of reduced skin contact and/or friction points
- Quick exchange of worn parts
- Individual fabrication

# Prerequisites for a Free Walk fitting

Providing the Free Walk orthosis is only recommended if the patient can almost completely extend his or her knee joint prior to heel impact. With this movement, the orthosis system locks itself for the stance phase (stance phase control). The muscular strength of the knee extensors (M. quadriceps) or the hip extensors (M. gluteus maximus) of the fitted leg should possess at least a strength degree of 3. As an alternative to an insufficient degree of strength, a Genu recurvatum can also assume the knee extension function.

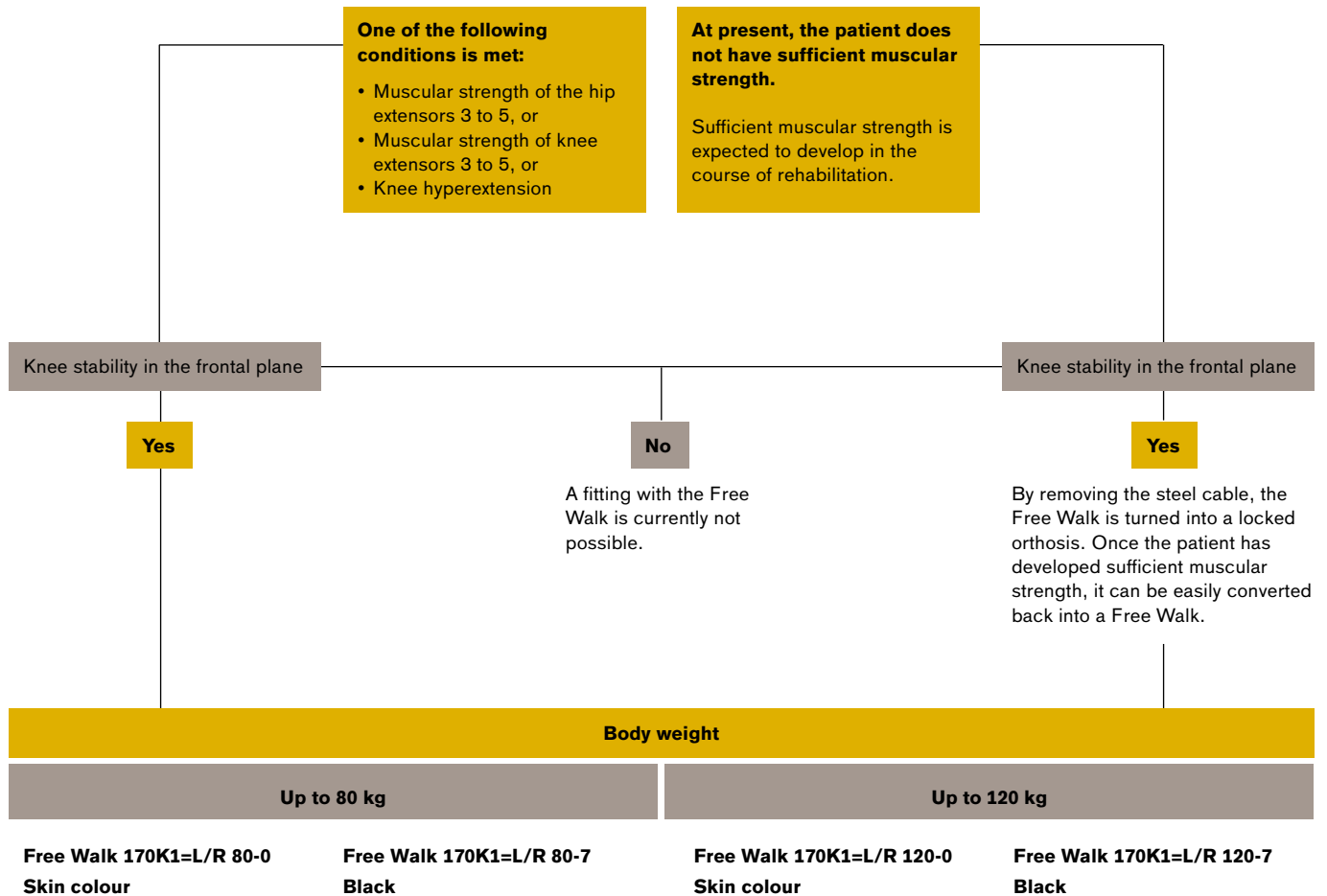
The patient must also be able to extend the knee joint before pushing off with the foot and allow for a dorsal extension of the upper ankle joint. This is how the orthosis system locks itself for the swing-through phase and the patient can bend his or her leg. Here too, the muscular strength of the knee extensors or hip extensors of the leg to be fitted should have a strength degree of 3. Furthermore, the upper ankle joint must permit dorsal extension of at least ten degrees.

Only patients who do not suffer from uncontrollable spasticity may be fitted with the Free Walk orthosis. Varus and/or valgus axis deviation in the area of the knee or upper ankle joint should not exceed ten degrees. (At more than 10° [up to 15°], a medial support must be used.)

In patients with a leg that is up to seven centimetres shorter, the difference can be compensated by the Free Walk orthosis. The fitting prerequisites mentioned above also need to be met in this case.



# Decision support



## Weight limit for the Free Walk orthosis

Ottobock delivers the Free Walk orthosis in two different versions:

- Free Walk for a body weight of up to 80 kilograms
- Free Walk for a body weight of up to 120 kilograms

# Fitting with the Free Walk



Free Walk Test Orthosis

## Free Walk test orthosis

The Free Walk test orthosis is available as a practical aid for specialist dealers. It can be used to quickly and easily determine if a fitting with the Free Walk orthosis is suitable for a patient – for example in rehabilitation facilities. Available in one universal size, it is applied over the patient's clothing and footwear.

### Important:

The Free Walk test orthosis is only available on loan from your authorised Ottobock branch.



## Fitting with the Free Walk

The orthotist takes patient measurements and prepares drawings. The Free Walk orthosis is fabricated for the patient based on this data. During the initial fitting, the orthotist adapts the foot component with foot stirrup and insert. He or she verifies the length dimensions, for example the knee and floor measurements, as well as the circumference. The orthosis settings can be corrected during the functional test. The orthotist explains the use of the orthosis to the patient and conducts gait training. Additional exercises follow; at the same time, the orthotist verifies the orthosis function and makes final adjustments as required. The Free Walk is only complete and ready for delivery once the patient feels comfortable with the orthosis. In order to ensure that the Free Walk functions perfectly for a long time, Ottobock recommends an inspection by an orthotist every six months.

# Free Walk accessories

Based on experience with the Free Walk orthosis, accessories for retrofitting were developed in order to allow patients to expand their range of mobility.

## 170D50 Free Walk triple control

### Indications

- The switch improves patient mobility by offering a selection of knee joint functions.
- The patient must be able to use the knee joint safely with each setting.
- This has to be evaluated and recommended by the attending doctor or prosthetist.

### Function

The triple control can be added to any Free Walk orthosis. It consists of a control unit on the knee joint and a switch connected to the control unit by a cable. The switch can be clipped to the patient's clothing. It is used to select one of the following three knee joint functions:

- Continuously free knee joint
- Free Walk function (stance phase locked; swing-through phase free)
- Continuously locked knee joint

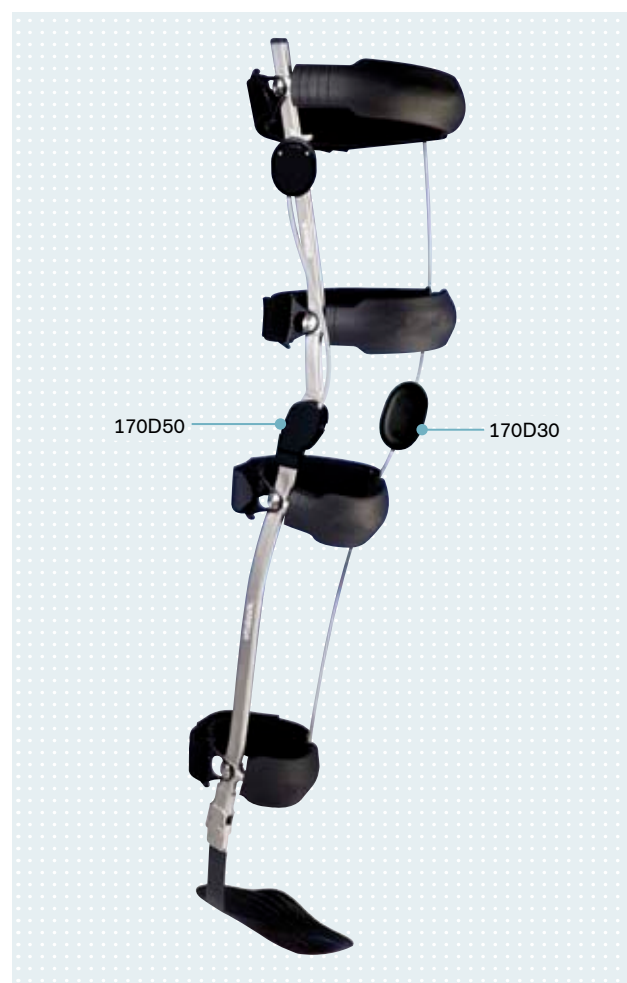
### Characteristics

- System that can be added to any Free Walk orthosis
- Plastic housing for the switch and control unit

Order no.	Side
170D50=	L
170D50=	R

## 170D30 Medial Support

The medial support is intended for patients with a valgus deviation of more than 10° (up to 15°).



### Additional information

- 646A214=GB Therapeutic application and gait training – Stance Control Orthoses E-MAG Active and Free Walk – Information for orthotists and therapists.
- 646D183=GB Free Walk orthosis – Patient Information

