Össur News

No. 2
2019



Willpower essential for successful rehab

A simpler post-stroke life

Smart tech for smart grips

Dealing with self-diagnoses

Kristel Höj Walther
Sights set on Tokyo 2020

Never-ending development



A year full of solutions

Before I welcome you to Össur News No. 2, I and the rest of Össur Nordic want to wish you, our readers, a very happy new year. We are thrilled that the first issue of the 'new' Össur News was so well-received, and we hope this issue will fare just as well. Our ambition was and still is to provide fun and interesting content that inspires and provokes interesting discussions.

OVER THE COURSE OF 2018, Össur continued to reinvest its earnings into our development of new products and solutions. As a result, we were able to launch several new solutions that are as interesting as they are innovative; solutions that allow users the world over to live "Life without limitations". Össur employs an indicator-based approach to our R&D efforts, which means that it is only solutions which have undergone clinical validation that are released to end users.

NATURALLY, OUR R&D department is in close contact with our global production facilities. A big part of Össur's advanced prosthetics solutions, including the Bionics products, are still manufactured in Iceland. Össur has had another production facility in Mexico for some years now, manufacturing not only other prosthetics components, but also the majority of our orthoses. The Mexico facility is also where our 'custom-made' orthoses are created based on the data we receive from our customers, individually adapted to the millimetre-level for their future users.

DURING 2018, Össur Nordic became part of the newly-created sales region North Europe, which includes the United Kingdom and Benelux countries. Globally, there are five regions that cover all of Össur's geographical markets in various shapes and forms, with active business divisions that offer the company's solutions to customers. For our part here in Össur Nordic, it means that we have gained more colleagues to work more closely and exchange experiences with. I am confident that this is a positive development for us as well as our customers.

WE HOPE THAT you will keep checking up on us in the new year and see what we've got to offer in the form of new ideas, projects and solutions. all of which are intended to make life easier for our customers and users!

We hope you enjoy this issue of Össur News!



Johanna Östergren
Managing Director Össur Nordic

Talk to us!

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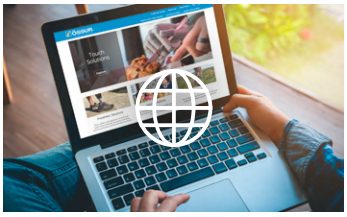
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Life without limitations









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Happening now

PROPRIO FOOT

Soon, we will release an updated version of Össur's microprocessor-operated prosthetic foot *PROPRIO FOOT*. The prosthetic foot's ability to automatically adapt to terrain provides a feeling of safety and is tremendously helpful to users, especially when climbing stairs and slopes. The adjustable heel height simplifies wearing shoes of different heel heights. It is set and adjusted with the Össur Logic app, and its new design - which includes a new foot plate - offers superior dynamics and exceptional rollover.





UNLOADER ONE IN SUCCESSFUL STUDY

Sören Toksvig-Larsen has headed the study that investigated whether the orthosis *Unloader One* can postpone surgeries for arthritis patients. The aim of the study was to develop a non-surgical treatment and has led to a good result. The patients who use the orthosis daily experience less pain and are able to lead a more active life a year on.



Photo: Patrik Löfgren

ORTHOSIS IN TESTING FOR KNEE LIGAMENT INJURIES

A pilot study with the orthosis *Rebound ACL* commenced this autumn at SÖS. The study is headed by Björn Barenius (*M.D., PhD, Dept. of Clinical Science and Education*) and aims to investigate the possibilities of improving treatment of anterior cruciate ligament (ACL) injuries. A small sample group will undergo treatment with Rebound ACL, and the hope is that it will result in the anterior cruciate ligament healing itself.



A NEW ADDITION TO THE MIAMI J FAMILY

Miami J Select is the latest member of the *Miami J* family. As with the rest of the family, the Miami J Select offers high comfort, quality and superior immobilisation. It comes with the highest number of height adjustment settings on the market as well as a patented locking mechanism that ensures it carefully aligns to the patient's body and provides comfort. Miami J Select is a universal solution that contributes to successful patient outcomes.

Success for 3D-knitted orthoses



13 years ago, Össur acquired the French company Gibaud. Today, it's success is undeniable, thanks in part to the knitted orthoses that make up the Formfit Pro collection.

Author: **Fridah Jönsson**

The French company Gibaud has been developing technical orthopaedic solutions since the 1800s. In 2006, the company was acquired by Össur, and 12 years later, it launched its flagship collection *Formfit Pro*, Össur's first internally developed range of knitted orthoses, manufactured in Gibaud's production plant in France. Jón Ragnar Hafthorsson is the Global Product Manager for Formfit Pro and says that the orthoses feature an advanced technology that provides a light, sensitive and stable protection for the body.

"The material we use to make Formfit Pro is a huge asset to users. All the products are manufactured using state-of-the-art techniques and are knitted in a specially designed 3D machine," he explains.

THE FORMFIT PRO range consists of orthoses for the knees, back, feet, elbows and wrists and can be used both for preventive purposes and during recovery. The range includes solutions for a variety of problems, such as knee protectors for short stretches and over-exertions, to back supports that help patients with degenerative disc diseases and lumbosacral strain.

THE FORMFIT PRO range will change considerably over the course of 2019. Five new products will be launched for knees as well as ankle joints.

"When the collection grows in the next year, I hope we will reach more people who need support to pursue their passions and do all the things they've been dreaming about. For Össur, this product range means that the company is breaking new ground and getting the opportunity to learn even more about what users the world over consider important in their everyday life. This is learning that we can apply to all the solutions we develop," says Hafthorsson.

No willpower no rehab

The key to success as a prosthetics or orthotics patient is motivation. Research in recent years shows that the healthcare provider plays a significantly greater role in building motivation than previously believed.

Author: **Karolina Arenhäll**

One of the most important ingredients for a successful rehabilitation is not the exercises the patient does or what shape they were in before, but rather motivation. Or as Gitte Flindt Hilding, a specialist physiotherapist at Bakke Rehabilitering prefers to call it: Willpower.

"We get nowhere if the patient doesn't want to. Getting a prosthetic is really tough. It's a long and hard process that demands a lot from them. If the motivation's not there, it's not a good idea," she said.

AND IF ANYONE should know, it's Gitte. Since 2001, she has worked with amputee patients who spend between eight to eleven weeks at the rehabilitation centre. Once their rehabilitation process is over, the patients walk out of the centre unassisted to the taxi on their new prosthetic. The patients are supported by a team of healthcare professionals: team nurses, physiotherapists, occupational therapists, orthopaedic engineers, social workers, psychologists and assistant nurses.

"We try to cover every base for the patient. Getting a prosthetic is life-changing, but the patient is more than just an amputee. That's also where we find their motivation. I try to find out what their dreams and aspirations are; what they want to achieve. Do they want to go dancing, cycling or invite their friends from the sewing club over for some coffee and biscuits? It's really important that each individual sets their own goals," she explained.

Gitte also notes that it's also important for her to make sure her patients set a lot of smaller goals that can keep them on track and motivated.

"We do a lot of small tests, such as 'how long can you stand on one leg?' At first, it might just be for a split second, but soon that becomes five seconds, and it really makes a difference for them to see that they are in fact making progress. Also when we connect their progress to some of their bigger goals, such as if someone wants to continue living in downtown Oslo. 'Sure, but then you have to be able to walk fast enough to cross a street before the pedestrian crossing signal turns red. And to walk fast, you need to practice your balance.' I think that when you understand why a milestone is important, it becomes a motivating factor."

RESEARCH IN RECENT years also points towards the importance of building motivation. In the 2018 study *Factors influencing participation in physical activity after dysvascular amputation*, for example, a team of researchers investigated what was required for patients to succeed with rehabilitation training. One of the factors was the support from the healthcare provider in the form of physiotherapists, check-up meetings, counselling and encouragement, all of which helped motivate patients to overcome the blocks they had created for their own training. But above all, the study showed that in order to even get patients to go to their first training session, they needed to learn more about their own disease/disability and in what way getting physically active would work as a form of treatment. This created expectations of the positive health effects that the training would lead to. If the patient was not given that knowledge, it was difficult to break the negative thought patterns, i.e. that there was no way to change the status quo.

In order for the patient to want to continue with the exercises, motivation was required, specifically in the form of the patient experiencing health benefits that maintained their mobility, a feeling of control over their condition, increased energy, happiness, an improved body image and – above all – a feeling of achievement.

The study has been published in Disability and Rehabilitation, and the full version is available on tandfonline.com.

The road back

It all began last autumn when 20-year-old Lina Schlotterberg's knee made a loud popping sound during a gymnastics training session. She would later find out that her anterior cruciate ligament had been torn. The accident marked the beginning of her rehabilitation journey with Rebound ACL.



Author: **Jessica Widing De Los Santos**

Lina had been an active gymnast for a long time, but had mostly been helping out at the local gymnastics association in Växjö, Sweden, for the past few years. One Saturday evening in November, she and her gymnastics friends were just about to wrap up their training for the day. Lina just wanted to do one last thing – a back flip followed by a front flip. The back flip went fine, except that when she landed on the mat, she heard a loud popping sound. Lina stopped when she felt that she wouldn't be able to do the front flip.

"I'm fairly pain tolerant, and it didn't hurt that much. But right after as I tried walking, I found I wasn't able to. I couldn't stand or walk on my leg. I figured that it wasn't anything serious, but my friends said that we should head to the emergency room."



Photo: Private

WHEN THEY ARRIVED there, Lina was sent on to the health centre, where they took an MRI of her leg. However, the MRI images didn't show anything out of the ordinary, and so Lina was able to head home. But her knee kept swelling, and on the following Monday she went to see a physiotherapist, who determined that her anterior cruciate ligament had been torn.

"I was offered to test the knee brace *Rebound ACL* as a treatment method, which sounded fine to me."

LINA WAS AMONG the first to test the Rebound ACL. Initially, the brace was configured so she would not be able to bend her leg very much. This was to create a shorter 'gap' between the ends of the cruciate ligament and thereby allow them to mend together again. After four weeks, the orthosis was unlocked so that Lina was able to bend her leg a little again.

The first magnetic resonance imagining performed on Lina's knee showed that the anterior cruciate ligament had been completely ruptured. The images from the follow-up imaging showed that it had begun to heal a little.

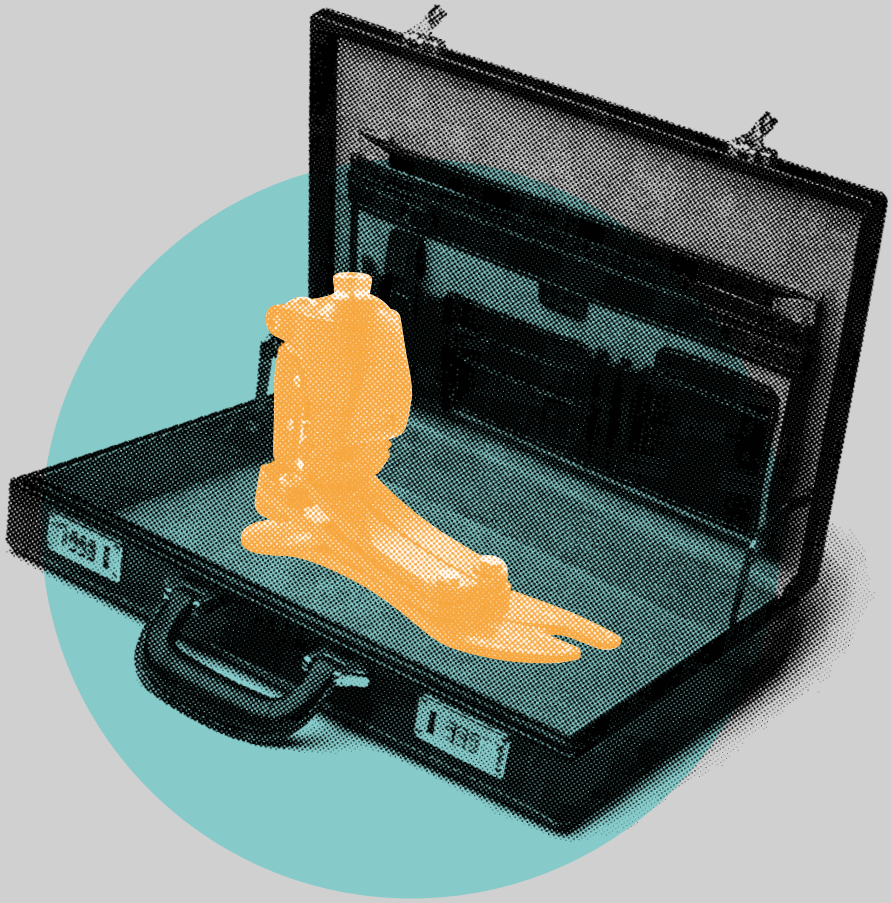
"I used the brace for 18 weeks, after which I no longer had a need for it. But they say that it takes up to a year before it's fully healed. I've started strength training now, and I hope that I'll be able to get back to gymnastics again soon," said Lina.

Read more about Rebound ACL on össur.se

There's always a solution

Anton Tryggvason's journey at Össur began with him trying out one of their prosthetics. 13 years later, he has gone from a demo patient to a sales representative and now travels the world with the goal of helping others.

Author: **Fridah Jönsson**
Illustration: **Love Eneroth**



When Anton Tryggvason had his leg amputated in 2005 following a post-surgery infection, he was the first patient in Scandinavia to test out Össur's prosthetic knee *RHEO KNEE*. He became a demo patient for the brand, and upon completing his bachelor in economics in 2010, he got a job as an Area Manager and sales representative at Össur.

"I've travelled around the world to fairs and conventions to demonstrate RHEO KNEE and seen that many people just accept the simplest form of support they can get because they're unaware that there's a better alternative out there. My motivation isn't to get a big bonus, but rather to get other amputees to understand that there are now prosthetics out there that allow their users to ride a bike, go running, dancing or play golf. There's always a solution," Anton said.

ANTON WAS ONLY 30 years old when he had his amputation performed, and he's realised that he doesn't look at amputations the same way others might.

"Some people consider amputation the last resort once all other options have been exhausted; it's the end of the road. For me, it was more like the beginning of the road, as the Anton I've been since 2005 is a completely different person. The only thing I miss is being able to dance freely to music in the same way I could before the amputation, and maybe being a little more lively in the evenings. But I'm able to do all the other normal stuff."

> *"What motivates me is to get people to understand that there are prosthetics out there that allow you to do everything you want."*



Photo: Private

Anton Tryggvason.

AFTER 13 YEARS as an amputee, Anton has gotten so used to his prosthetic that it no longer defines him as a person.

"I'm a salesman, I'm the father of two children, a homeowner... the fact that I'm an amputee is no longer the first thing that springs to mind when it comes to my identity. Now, I suspect people more often think of me as 'Anton, the guy who works at Össur' rather than 'Anton, the guy with the robot leg'.

Self-diagnosis
– problem or benefit?

Patients as a whole are becoming more knowledgeable, and many end up diagnosing themselves based on their own research. What is the best way to adjust to this new reality? And are there benefits to patients researching their symptoms online?

Author: **Anders Lindgren** Illustration: **Love Eneroth**

It's only natural to try to find as much information as possible about your health ailments, and in this digital age, we are increasingly going online to look into what might be the underlying cause of our symptoms.

MANY PEOPLE REGARD this as a democratisation of the patient-doctor relationship and believe that in the long run, it can result in better healthcare as patients are increasingly able to hold their healthcare providers to a higher standard. However, for healthcare practitioners, this development poses quite a few challenges to their daily work at the clinic.

HEALTHCARE WORKERS express in interviews that the patient appointments have become more complicated as people have begun to google their symptoms, which can lead to exaggerated fears about what may be wrong with them. It becomes more difficult to get through to patients who have misinterpreted information they have found online. The many questions they have after searching for information online can also result in consultations lasting longer, especially when the questions are based on misinterpretations or misunderstandings. Additionally, some patients may be convinced that their self-diagnosis is correct even before seeking help or having their condition assessed by a doctor, who may have to spend a long time 'debunking' it.

SO WHAT'S THE best approach to take with a patient who has self-diagnosed themselves? One finding from interview studies is that it's important to tackle such situations in a professional way rather than act dismissive of information that the patient has brought along, even if it should turn out to be wrong.

"The consultation has become more important now. So the consultation-theoretical perspective – i.e. ascertaining how things look from the patient's point of view and why they feel they way they do and engaging in discussion to agree on what their symptoms really indicate - becomes paramount in our interaction with patients," said Ove Andersson, second vice chairman of the Swedish Medical Association.

"It's also about being clear on what information has been validated and is accordingly more reliable and results in a higher quality of medical care."

EVEN IF YOU have a busy work schedule, it's also important to allocate some time to educating patients during consultations. This ensures that patients feel involved and learn more about their health, which leads to improved well-being.

BUT IN REALITY, you could say that the interaction starts long before the patient even arrives at the clinic. It starts with the first googling of their symptoms.

"That's why healthcare authorities should always make sure to 'market' their knowledge databases, such as 1177 [in Sweden], and ensure that the advice provided on those platforms is the most validated and of the highest quality from a medical perspective. It's partly about providing individuals with the best knowledge available, but also about building trust and confidence in the healthcare system. If society does not take that responsibility seriously, commercial and alternative sources end up gaining too much influence," said Andersson.

AS A DOCTOR, is there any way to take advantage of a situation where the patient has googled their symptoms and has done a bit more 'homework' on their condition? When the knowledge that the patient already possesses is relevant, it can hasten their treatment process, as the patient already has some understanding of the problem and the doctor doesn't need to start from scratch.

Andersson believes that fundamentally, it's a positive thing that people try to solve their health problems on their own. Consultation theoretical research also shows that the discussion that arises from the doctor identifying the patient's concerns and beliefs play a major influence on the patient's perception of their healthcare experience and prognosis. And such discussions tend to be more comprehensive with patients who have self-diagnosed themselves.

"However, the research that has been done in the field of consultation theory is somewhat dated by now and doesn't take into account the enormous volume of information that is available today."

IN OTHER WORDS, there's future research to be done on how online health information affects the individuals who google for it as well as the healthcare practitioner' work.

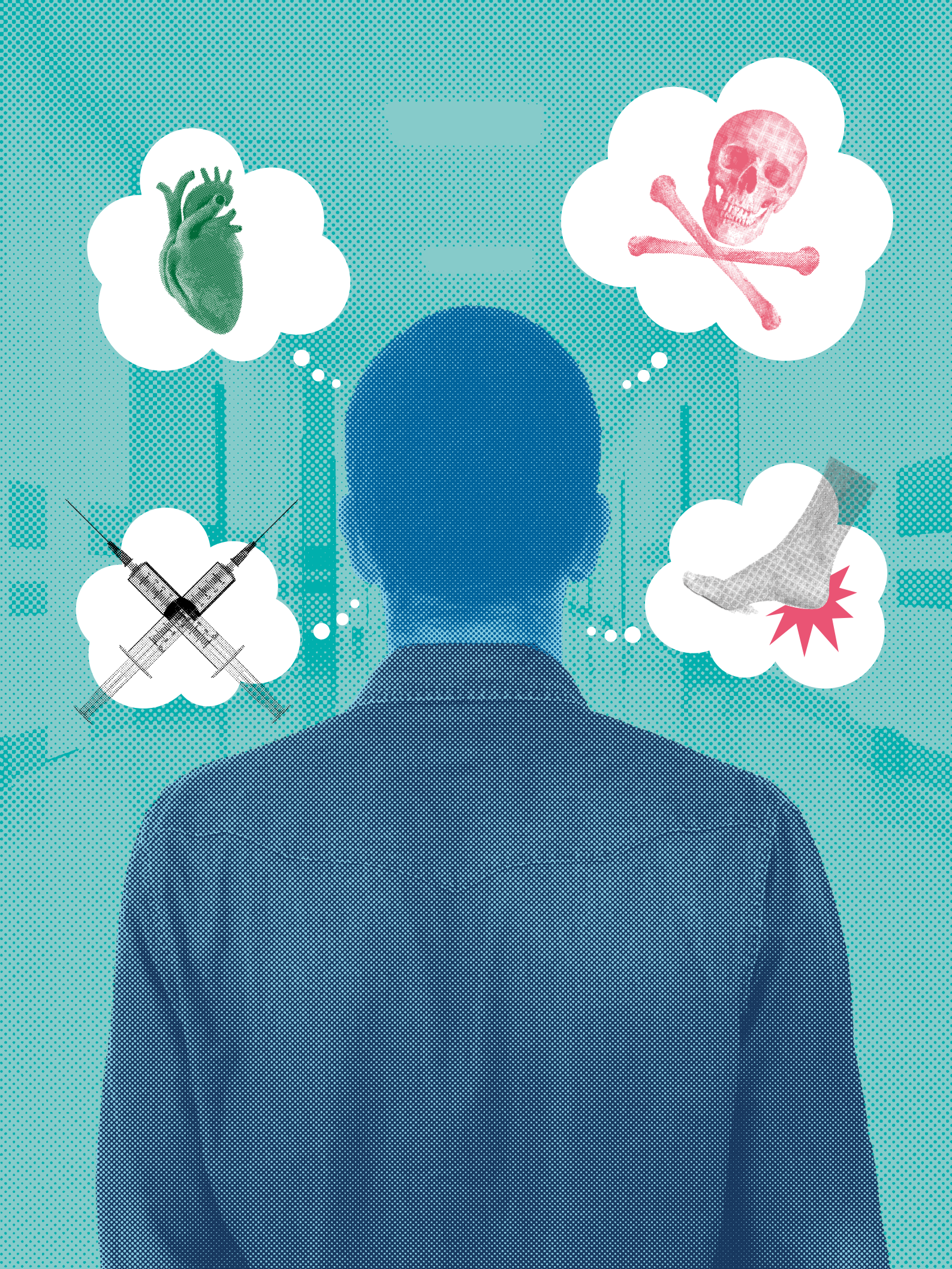


Photo: Bo Amstrup



With the prosthetic *Cheetah Xplore*, Kristen gets the stability she needs.



Sights set on Tokyo 2020

Discus thrower Kristel Höj Walther from Odense is a true fighter who rapidly advanced to the international top league of her sport. But becoming a discus thrower wasn't actually part of the plan to start with.

Author: **Anders Lindgren**

Just two years after she started training discus throwing, Kristel Höj Walther joined the Danish Paralympics team and got to participate in Rio 2016. In 2018, she brought home her first international championship medal – silver – from the World Para Athletics European Championships. Becoming so successful in such a short time speaks not only to her talent, but also her strong willpower and determination.

"I'm stubborn, and many people describe me as a fighter. But this is also something I really want to do, and I draw a lot of inspiration and motivation from other athletes. In addition to being inspired by the greatest athletics stars, I'm also part of a training group where we motivate each other."

HER FAMILY ALSO helps fuel her motivation, and several of her relatives have been successful at sports. Both her grandfather, Karsten Walther, and her great-grandfather, Aage Walther, were part of Olympic group gymnastics teams. Karsten participated in the 1952 Helsinki Olympics and Aage in the 1924 Olympics in Paris, as well as the 1920 Olympics in Antwerp, where he took home a silver medal.

SPORTS IS A big part of Kristel's identity. She grew up on a farm outside Odense, Denmark, and was a gymnast and played football in her younger years. In her late teens, however, she started to experience pain in her right foot. The source of it turned out to be a benign, yet aggressive tumour in her right heel. Even after the tumour was surgically removed, the pain lingered. Because she wasn't able to properly put her weight on her foot, her entire body was eventually in pain because of the way she had to walk.

THAT'S WHY AT the age of 20, she finally decided to have her foot amputated. The decision was entirely her own, and she doesn't regret making it, as the amputation finally rid her of the pain, allowing her to get back to living a more active life.

"It became a new start for me, and I realised that I could still do most things without limitations. Removing my foot wasn't traumatic; the difficult

> *"It felt wonderful being able to run again.*



Photo: Louie Martinez

Tokyo, the host city for the 2020 Paralympics.

time in my life was the time before the amputation, where I wasn't able to do anything because of crutches, surgeries and because it quite simply hurt too much."

A COUPLE OF years after her amputation, she got to try out running with a *Flex-Run*, a prosthetic foot specially designed for running, developed by Össur in collaboration with Nike. That's when she found her way back to sports.

"It was a wonderful feeling, and being able to run again felt amazing. I became completely set on training and competing in sprinting and long-distance running. But then my left knee started acting up, and I had to take it easy for a while."

Her trainer then suggested that she try out discus throwing instead – at least until her knee was better. But she wasn't having it.

"'No, no, no,' I said. After all, I had no plans whatsoever to pursue a career in discus throwing, and didn't see myself as a discus thrower. But he convinced me to give it a shot, and it turned out that I loved it from the moment I started. In discus throwing, you have to be really strong, explosive and technical at the same time. I like that combination, and I can really nerd out with the technical details," she laughed.

DURING A DISCUS throw, her prosthetic is subjected to a demanding and challenging level of stress. When she throws the discus, she shifts a lot of her body weight onto the front of the foot, and to complete the rotation through the entire throw, she must land directly on her prosthetic. At the same time, the prosthetic is subjected to a lot of torque.

"I use a *Cheetah Xplore* and *Iceross Seal-In V liner*. It's locked in place with vacuum suspension, and to be a hundred percent sure it doesn't loosen, I also use a sleeve. The prosthetic foot also has a cosmetic foot, which is a big advantage since it allows me to use shoes specially adapted for discus throwing. I completely trust my prosthetic. We're a good team, my Cheetah and I."

TODAY, KRISTEL is 30 years old and works as a communications assistant at Ortos A/S. She's currently training with her sights set on the 2019 World Championships in Athletics in Doha and the 2020 Tokyo Paralympics. But even though sports takes up a big part of her life, it's not all about training and competitions. Music is also one of Kristel's big passions, and has been for a long time.

"When I was younger, I was in a band. I had a lot of fun playing guitar and singing. I can't find the time to play that much nowadays, but I love listening to music and still go to the occasional concert. When I need to relax after a rough day of discus throwing or a stressful day at work, I like listening to classical music, for instance."

WHEN SHE'S NOT training, Kristel uses a *Pro-Flex LP Align*, a prosthetic she helped evaluate as part of a so-called 'Market Acceptance Test'.

"Aside from the fact that it gives me energy back when I put my foot down, it also has a really neat function. It's got an adjustable heel height - up to seven centimetres – which gives you so many more options when it comes to footwear. You can even wear it with high heels. That's a big plus for us users, and not just for women. Even smar dress shoes for men always have a small heel. And now men too can wear nice-looking footwear for casual as well as formal occasions," says Kristel, who feels that life with a prosthetic has given her a lot of experiences and taken her places around the world that she likely would never have visited otherwise.

"And that's really something I think about and appreciate – and take every chance to enjoy."

Smart & functional

With their specially designed prosthetics made for everyday life, their focus is entirely patient driven, from typing on a keyboard to brushing hair. Read more about the Scotland-based company Touch Solutions and Össur's smart, functional and aesthetically appealing solutions for the outer extremities.

Author: **Fridah Jönsson**



Touch Bionics joined the Össur family in 2016 and now operates under the name Touch Solutions. The Scottish company had only been around since 2003, but rapidly established itself as one of the leading manufacturers of prosthetics for the upper body, especially hands. When it comes to hand prosthetics, the whole product must be thought-out to the smallest detail in order to carry out its function, and the solutions designed by Touch Bionics go above and beyond that requirement.

ONE OF THEIR flagship products is the *i-limb Quantum*, which is the first arm prosthetic that makes it possible for the user to change their grip with a single gesture. It can be connected to a variety of mobile units, such as the Apple Watch, which gives the user access to 24 pre-programmed and 12 personal grip patterns.

TOUCH SOLUTIONS' STRENGTH lies in identifying the everyday things that users need help with. The aforementioned i-limb Quantum can even be controlled with so-called *Grip Chips*, small chips that work via a Bluetooth connection and adjust the prosthetic's pre-programmed grips for a specific object.

THE USER SIMPLY has to place their Grip Chip near the object they want to use optimally. For example, you could place a Grip Chip near your PC, whereupon the prosthetic understands that you want to use the grip adapted to type on a keyboard. If you place it next to your toothbrush, the Grip Chip is programmed to make it easier to grip the toothbrush, and so on.

TOUCH SOLUTIONS IS also mindful of the fact that users often prioritise aesthetics as highly as functionality. In 2008, the US company Livingskin and Touch Solutions therefore began selling prosthetic hands individually made from silicone, with different skin colours, birthmarks and even tattoos, to allow every user to see their prosthetic as an extension of themselves.





The expert corner

On motivation and self-diagnosis

What's the best way to motivate your patients to complete their rehabilitation and use their orthopaedic products? And how do you deal with patients who google their symptoms and come up with their own diagnoses? Orthopaedic engineer Jan Drakander from TeamOlmed offers his advice.

Author: **Anders Lindgren**



> *It's important to have a dialogue where we arrive at a consensus.*

How do you motivate your patients to go through a rehabilitation plan and use your orthopaedic technical products?

"Based on the needs analysis, which is based on the doctor's and my own assessment of the patient's needs, I engage in a dialogue with the patient. In the dialogue, I ask about their preferences and what's important for them to want to use their aid."

"It's important to have a dialogue where we arrive at a consensus; how this aid is going to help the patient in various situations, such as in their professional life or in other activities. If I manage to get the patient involved in the discussion, they're most often also up for following the rehabilitation plan and using their orthopaedic aid."

Are there any special tools that you use to boost your patients' motivation?

"There are some good apps with training programmes worth following, for example for arthritic patients. This gives them the flexibility to train on their own whenever they want and are able to."

"The advantage of apps is that they are always being expanded and continually updated, while books become outdated pretty fast."

You probably encounter quite a few patients who have self-diagnosed themselves. What's your take on that?

"It's becoming increasingly common for patients to have done their homework, googled their symptoms and made their own diagnoses. They're free to share their research and any conclusions they've found through Google when they see me. Engaging in a dialogue with the patient about their findings is also important."

"I base my orthopaedic analysis on a medical assessment. That's why it's important that the patient has met with their assigned doctor who's made a diagnostic assessment. The referrer, who has the medical responsibility, sends me a referral that states the diagnosis/disability and what the purpose and goal is for the aid. I then base the components and aids the patient needs on the statement from the referrer."

The dream lives on

A knee injury could have spelled the end for Simon Brännström's entire sports life. But thanks to Össur's CTi orthosis, he's now able to continue with his sports as before and protect himself from getting injured again.

Author: **Fridah Jönsson**



Photo: nilssebastian.se

Be it ski jumping from high slopes in the winter or motocross racing at breakneck speeds in the summer, 18-year-old Simon Brännström has a way of satisfying his adrenaline quota and need for speed all year round.

A common misconception about motocross is that you only need to step on the gas and keep your hands on the handlebar, but it actually requires a lot more effort than that. Simon's sport has him training six days a week, and aside from strength training and fitness, motocross also has a large psychological component to it.

"You have to know what you have to do to ride fast. It could be the way you need to ride in a curve to maintain a high speed or how to keep your eyes up front so you don't accidentally ride into the biggest pit in the field. You have to train your whole body to its limits. In fact, motocross has been nominated as one of the world's most physically demanding sports," Simon said.



Foto: Marcus Marklund

Photo: nilssebastian.se

HIS PHYSICAL training also serves an additional purpose: To strengthen his knee following his injury in 2017. During a motocross training session near Skellefteå, Sweden, he and his bike hit a hole in the field.

"I lost my footing and rushed down the field, landing on my knee the wrong way. I didn't fall off, so I was still able to ride but I couldn't stand on my leg. So, I drove through the forest to my father, who helped me get all my things and onto a bus."

He headed to the hospital, where the staff took an MRI of his leg that revealed that nothing was broken. Simon therefore went back to work at his new summer job. But when the pain still persisted after two months, he had no other choice but to book a new MRI, which revealed that not only had the anterior cruciate ligament been torn, but also the medial collateral ligament had been stretched and the inner side of the meniscus had been torn.

"I was really angry and upset," Simon recalled. "This happened in October, so I thought I'd have to miss out on the entire skiing season. But they said that my knee joint was so tight and didn't have any seriously weak connections, so I'd be fine without cruciate ligaments if I trained enough."

HE BEGAN LOOKING for different aids that could allow him to continue with his sports, eventually coming across Össur's *CTi*-orthosis.

"I thought it looked stable, since it's not just made from fabric but also has a carbon fibre frame and silicone inner lining that keeps it in place. It was also nice that it's well-suited for skiing. A lot of braces go further down the shin and bump against the top edge of the ski-boot, but this one didn't."

SIMON TRIED OUT the brace, and a year later he's still wearing it during his motocross and ski training sessions.

"It's the CTi that allows me to go skiing at all," he pointed out. "Initially it helped me go skiing, but this summer during the motocross season, I wanted to protect my other knee so I wouldn't injure it in the same way, so now I wear a similar brace on the other leg too."

His dream is to make a living off motocross racing.

"Well, I want to become as good as possible. There aren't a lot of people in Sweden who have the opportunity, but it would be a lot of fun to join a team where you get paid for riding your motocross bike."

CTI



CTi was designed in 1983 after the motocross driver and skier Jim Castillo injured his knee. The name comes from the materials that the product is made of, carbon and titanium. Even though the design has been refined several times since the 80s, the core of it remains unchanged; a stable frame and non-elastic bands. The orthosis is individually tested to fit every single unique user.

Silic

Silicone is a material that you can find in a lot of the things you use on a daily basis. You'll see it in the kitchen and bathroom, at the garage and, not least, in the healthcare sector. But how and why has silicon become so popular, and what characterises this durable material?

Author: **Pål Johansson**

The word silicone is derived from silicium, the Latin name for silicon, which makes sense as silicon is one of the core elements of the material. Silicones, also known as polysiloxanes, are the umbrella term for inorganic polymer compounds made of chains of silicon atoms and oxygen atoms. These chains are often combined with hydrocarbon compounds, typically methyl, ethyl, propyl or fenyl groups.

SILICONES CAN BASICALLY BE considered something between organic and inorganic polymers and exist in liquid as well as a solid, rubber-like form. The molecules in the silicone can be formed into something resembling chains or three-dimensional nets. The length of the chains, extent of the net structure and the composition of the remaining hydrocarbons determine the physical form and qualities of the silicone, which can range from liquid to solid.

In order to ensure the material maintains its final characteristics, it must undergo a vulcanising process using a catalyst, usually a metal or acid. The process relies on heat, air humidity or pressure. In laboratory environments, the silicone's characteristics are subsequently fine-tuned to alter its durability, elasticity or pigmentation to make it fit-for-purpose. This is done by adding different additives. The hardness of the material is given a 'Shore durometer' rating where the higher the value, the harder the rubber.

WHAT ALL SILICONES have in common is that they are always heat-resistant, have a low surface tension, high lubricity and good water repellency. Silicone is capable of handling temperatures from -55 to +300°C without losing any of its beneficial qualities. It's also a practical material in several other ways. For instance, it's non-toxic, does not conduct electricity, does not dissolve in water and is relatively unaffected by other chemicals. The

cone

– a versatile material

fact that it's such a tough and durable material is what has made it so popular in many different fields.

FOR MANY, SILICONE has become synonymous with cosmetic surgery – especially breast implants. But its uses go way beyond that. For example, the material is used in sealants, lubricants, glue, medicine, kitchen utensils and thermal and electric insulation. Silicone filleradhesives are soft and malleable before they harden, making them flexible to work with. The material also comes in the form of oils, fats, gels, elastics, varnishes and thermosetting plastics.

It's used in the cosmetics industry as an ingredient in lip gloss, hair products and various creams, for example. It's also an important component in the automotive, clothes and electronics industries. In the field of medicine, silicone is found in instruments and implants such as intraocular lenses, pacemakers and tissue expanders.

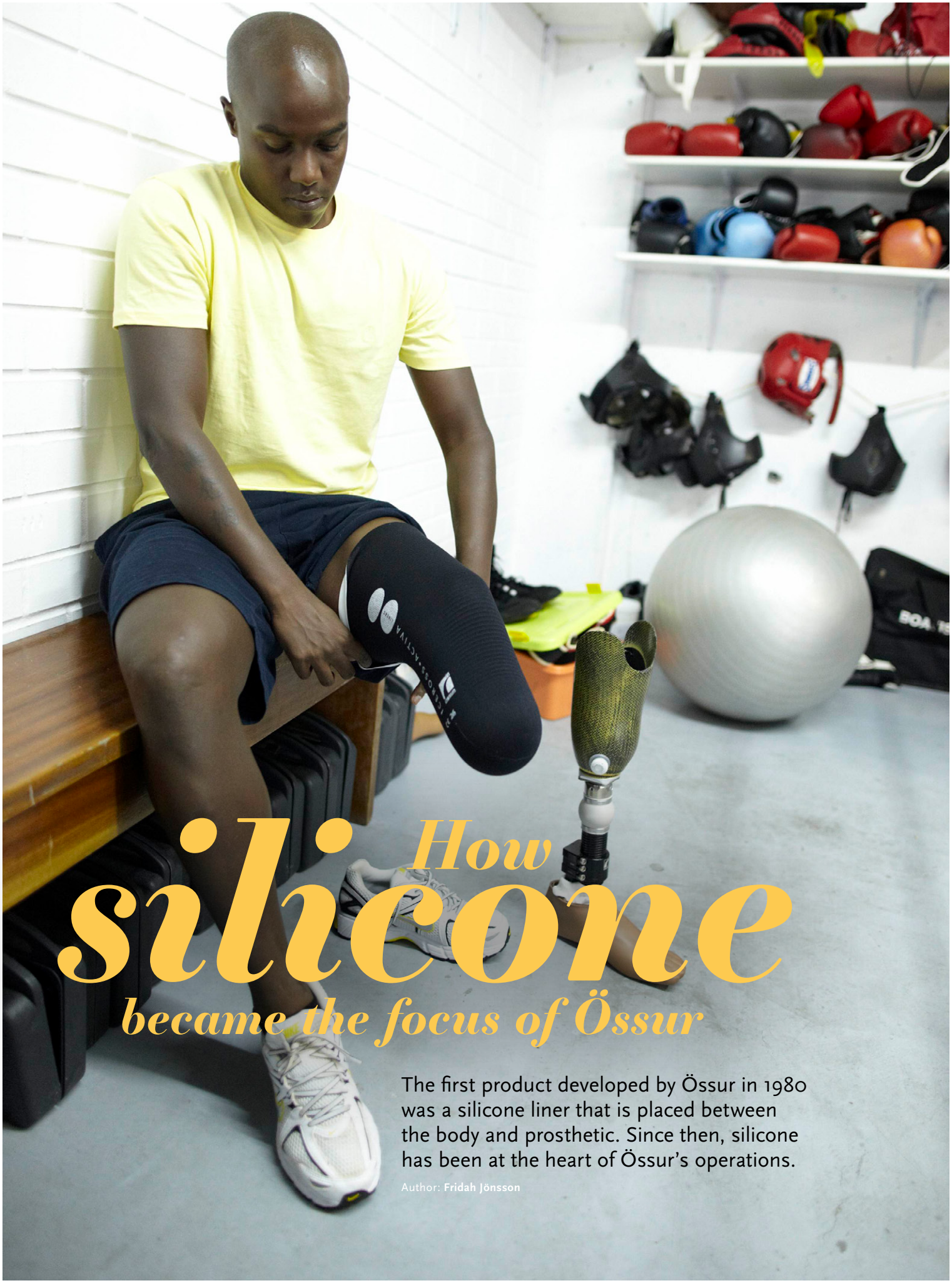
DID YOU KNOW THAT...

... silicone is found in household products such as sun lotion, polishing agents, soaps and chewing gum?

... silicone is used in reconstructed implants such as nose and chin implants, as well as artificial joints in wrists and fingers?

... soft silicone tape is suitable for nearly all circumstances where it is important to prevent further trauma to a wound and the surrounding skin, as well as pain for the patient?

ONE MIGHT ASSUME that the material is something of a newcomer, but it's has actually been around for quite some time. Already in the mid-1800s, scientists were taking the first steps towards what would ultimately become known as silicone. The material was commercialised in the 1930s when the aviation industry needed hydraulic oils and lubricants and could handle dramatic temperature changes. As people began to study characteristics of silicone in-depth, they discovered its potential for broader applications. Find out why Össur has chosen to work with silicone specifically in the next article.



How silicone became the focus of Össur

The first product developed by Össur in 1980 was a silicone liner that is placed between the body and prosthetic. Since then, silicone has been at the heart of Össur's operations.

Author: **Fridah Jönsson**

Guðlaug Sigurðardóttir is Össur's Global Product Manager and primarily works with liners, a sort of 'strong sock' made from silicone which is rolled directly on the residual limb. Its main function is to distribute the load and serve as 'extra skin' between the hard prosthetic socket and residual limb. She explains that Össur's entire product range of liners is made from silicone, as it has always been a winning concept among users.

"Silicone actually serves as the foundation for Össur as a business," Guðlaug said. "Since our founder, Össur Kristinsson developed the *Iceross* liner in the 1980s, we have constantly been building on and developing his idea with the addition of new innovative solutions, because we believe this technology and all our products provide high functionality for our users."

> *"Since I began using silicone for the first time, I've been convinced that it's the material of the future."*
>
> *Össur Kristinsson – Founder of Össur HF*

ACCORDING TO GUÐLAUG, there are many reasons why silicone is such a great material.

"Some of the benefits are that the silicone allows the product to offer more protection, and it's also able to even out the load across the residual limb in a good way. It's also a really durable material in the sense that it's easy to stretch without losing its original shape. Other materials can adapt their shape to the body, but stretch out over time and ultimately make the product too big for the user. Silicone, on the other hand, always reverts to its original shape and therefore always fits the user.

THE TECHNOLOGY BEHIND silicone has continued to progress in the many years that Össur has been active in the industry. Össur is constantly striving to stay up-to-date on new development opportunities but always starts from the same original idea, refining it in various ways, which is not always easy. Taking a new product from the idea stage to application can take anywhere from six months to two years, and moreover, Össur is working with a material that is still in development.



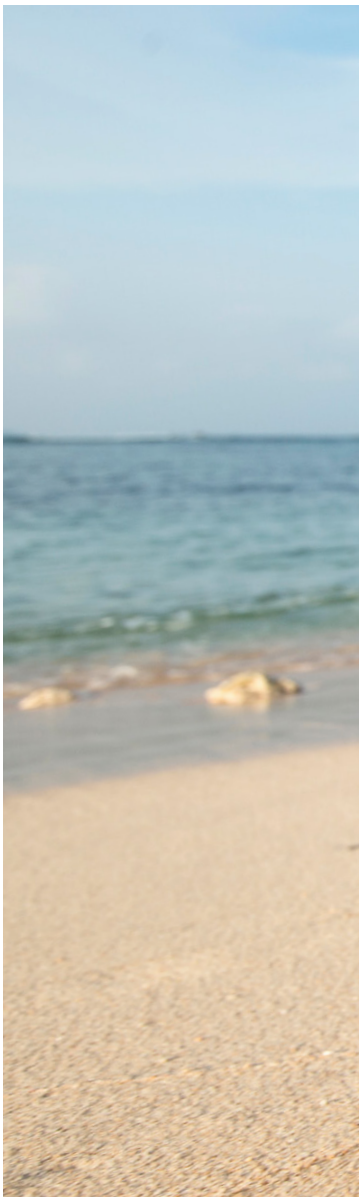
Icecross Activa

"What's changed the most in the years that Össur has been using silicone in its production is in relation to how the material is made," said Guðlaug. "One of the big changes is that using silicone has become a lot easier on the skin. In our liners, we have also begun adding aloe vera to the silicone in recent years to moisturise the skin on the residual limb."

ÖSSUR STILL RETAINS its production facilities on Iceland, where it all started. The plant is located in Reykjavik, and the 80 employees in the silicone production unit make over 700 different items that include different sorts of liners, sizes and shapes, producing more than 26,000 silicone liners each week. In other words, it is a never-ending process, which is going to see a lot of changes over the course of 2019.

"I'm still not able to share exactly what it's about yet, but our goal is to always investigate - and understand - what our different users' needs are," said Guðlaug. "We're always trying to continue refining and developing the most effective solutions in these areas, and we want to retain the position we have today, continue with slightly more advanced technology and develop the solutions that benefit our users.

A simpler life after a stroke



Stroke is becoming one of the greatest epidemics of our time. In spite of the fact that the number of people who suffer a stroke has fallen over the course of the 2000s, around 70,000 Scandinavians still have a stroke every year. Foot drop is a disability that can arise as one of the complications following a stroke.

Author: **Pål Johansson**

Despite the fact that stroke cases have fallen by 40 percent in Sweden during the 2000s, someone in Sweden still suffers a stroke every 20 minutes on average. This amounts to around 20,000 - 30,000 people a year in Sweden alone. In Denmark, the corresponding figure is 20,000, followed by 14,000 in Finland and 10,000 in Norway. The average age of those who suffer a stroke is 75 years, yet a sizeable proportion – 20 percent – are below the age of 65.

THE DECREASE IN the number of strokes in recent years is believed by experts to be linked to Scandinavians generally living healthier lives while at the same time public health services have become better at detecting people who are risk of having a stroke. A decline in the number of smokers, combined with an increase in the number of people who exercise, are key factors in explaining the reduction in stroke cases. Studies show that physical activity and a healthy diet are crucial factors to avoid having a stroke, as this lowers your blood pressure, reduces the risk of obesity and diabetes while also contributing to a lower cholesterol count. Around 60 percent of stroke victims have high blood pressure.

A STROKE IS an umbrella term that covers both its sub-types, namely ischemic stroke and hemorrhagic stroke. The former accounts for around 85 percent of strokes, while the latter accounts for the remaining 15 percent. Aside from causing a lot of suffering for the patient and their next of kin, every stroke also comes with major costs to society. Stroke is the disease that claims the most hospital days in somatic healthcare, and according to the Swedish Stroke Association, adds up to a cost of nearly SEK 18 billion each year for society.



STROKE IN THE WORLD

17 million cases of stroke per year.
30 cases of stroke each minute.
6,2 million die of the disease.
1 of 6 suffer from stroke at some point in life.

Source: worldstrokecampaign.org

Foot drop patients often encounter major difficulties getting through everyday life.

BECAUSE THE BRAIN governs every function in the body, a stroke can have physical and cognitive effects and lead to physical or cognitive disabilities. The complications vary tremendously from case to case, depending on the severity of the disease. Typical impairments for stroke victims include partial paralysis and numbness in parts of the body such as the arms and legs, difficulty speaking and problems eating and drinking. But it can also result in many other common – and less visible – impairments such as fatigue and balance problems or difficulty remembering things, multitasking or concentrating.

ONE OF THE complications following a stroke can be the condition called foot drop, where the patient's dorsiflexion is either reduced or completely lost. This means that the muscles that bend the foot up towards the shin are no longer functioning as they should, resulting in impaired mobility or drop foot. The condition can vary in severity and complexity, and in some cases, remedied and improved. Someone suffering from foot drop tends to have a special and fairly conspicuous way of walking, where they have to lift their leg higher than normal with every step to avoid having to drag their foot along.

WHAT ALL FOOT drop patients have in common is that they often encounter major difficulties getting through everyday life, as they are more prone to tripping or falling, for instance. With the orthosis *Rebound Foot-Up*, Össur has created a dynamic and discrete aid that's comfortable as well as easy to use. It can be slipped on and off smoothly with a single hand and is simple to adjust. The focus has been on usability throughout the development process of the orthosis. It has been anatomically designed to follow the shape of the foot, and it also allows for medial and lateral control when necessary. With the complementary product *Foot Wrap*, the user can also use the orthosis bare-footed or when wearing sandals.

Sources: The Swedish Stroke Association, Neurologi i Sverige, Swedish National Board of Health and Welfare.

To Iceland and back

To ensure they last long and continue working without issues, certain prosthetic components need to undergo proper servicing once in a while. But what actually happens after those components are picked up by UPS? Follow our RHEO KNEE XC on a journey through the different stages of the servicing process.

Author: **Jessica Widing De Los Santos**



The first thing that happens after the *RHEO KNEE XC* has been collected is that the knee joint is transported to Össur's distribution centre in Eindhoven, Netherlands. A temporary replacement knee joint is also sent to the customer from here if they have requested one.

Following processing at the distribution centre, the knee joint is shipped to the repair centre in Reykjavik, Iceland. That's when the clock starts ticking for the actual servicing process.

"We always aim to send back the knee joint to the customer within 20 days from the day it reaches us here at Össur Distribution Centre," said Erla Eriksdóttir, Bionic Service Coordinator at Össur's head office in Reykjavik.

THE FIRST THING THAT happens when the knee joint arrives at the repair centre is that it is analysed. While waiting for the results of the analysis, the knee joint is tested in a special Rheo test machine.

"All knee joints are tested in the same way, where we check how they function electronically, mechanically and in a general sense," said Erla.

IF THEY ARE unable to identify the issue described by the customer, or if the issue is unknown, it takes further tests and analyses and therefore also a slightly longer time to fix what's wrong with it. Occasionally, it's necessary to user-test the knee joint or have a production engineer investigate the problem.

ONCE THE TESTS HAVE been completed and the results analysed, the knee joint undergoes servicing. As an additional quality assurance step, the knee joint goes through a final test to check that everything is working as it should before it's sent back to the customer.

The servicing process may seem like a lengthy process; what is it that actually takes so much time?

"It's a combination of several things. Partly the transport. But after that, every product sent to us for servicing must undergo the same standardised tests and repairs in order for us to maintain a high servicing standard. There are no shortcuts you can take; it just has to take the time it takes. What matters most to us is being able to provide great customer service, and our goal is always for the servicing process to run as smoothly as possible for the customer."

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REMEMBER!

By describing the problem you are having with your product in as much detail as possible, Össur may be able to identify the underlying issue faster. In turn, this helps ensure the user gets their knee joint back faster.



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