directLINK

Magazine for Arthroplasty · Issue: January 2015

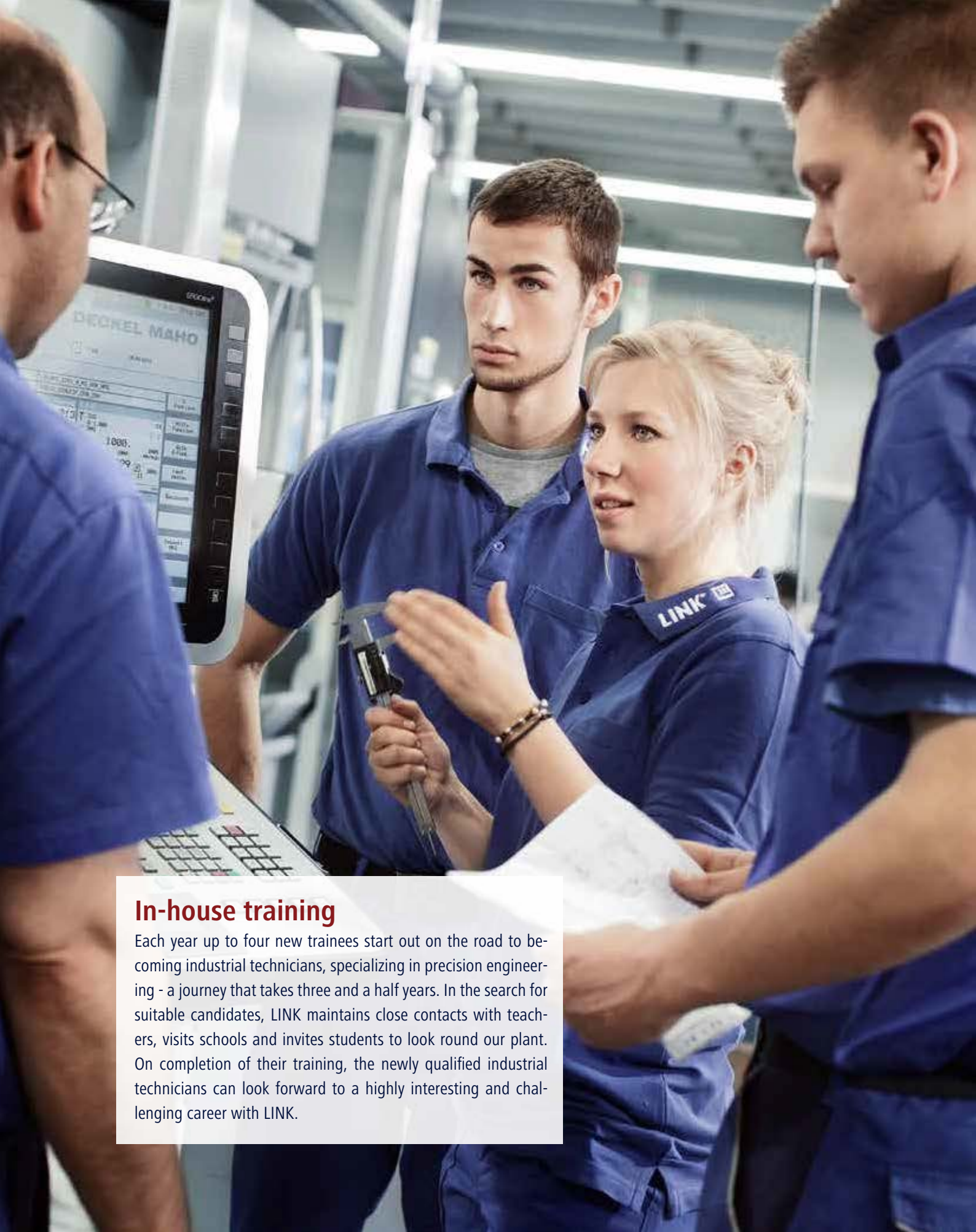
»A solution had to be found urgently!«

An interview with Professor Maurilio Marcacci about metal hypersensitivity, training of young surgeons, and nanotechnology in the field of arthroplasty

Video interview with co-developer of the **SP-CL®** **Hip System** from LINK, Prof. Dr. med. Thorsten Gehrke. Simply scan the QR code with your smartphone.

35 years in situ: LINK supplies spare parts for 35-year-old St. George® knee joint prosthesis

Megasystem-C®: joint preservation in a case of knee arthrodesis following periprosthetic infection



In-house training

Each year up to four new trainees start out on the road to becoming industrial technicians, specializing in precision engineering - a journey that takes three and a half years. In the search for suitable candidates, LINK maintains close contacts with teachers, visits schools and invites students to look round our plant. On completion of their training, the newly qualified industrial technicians can look forward to a highly interesting and challenging career with LINK.

Dear Readers:

I recently read a column written by a management consultant in which he expressed the opinion that making decisions solely on the basis of financial figures is like driving at 100 mph and only looking in the rear-view mirror. I agree with this view whole-heartedly.

Figures essentially describe what has happened in the past, but on their own are not very useful for defining what action needs to be taken next. At LINK, figures have never been a substitute for a far-sighted approach, which means looking to the next generation of surgeons, staff and trainees, developments in the field of medical technology and new products. In this issue of **directLINK** you will find lots of information on this subject.

Read about why Prof. Maurilio Marcacci has gone over to using knee implants with hypoallergenic surface modification, and what Prof. Dr. Andreas Niemeier sees as the way forward from the surgeon's perspective.

LINK invests both in young trainees and in continously enhancing the skills of experienced surgeons – as exemplified by the surgical workshop for the MITUS® RS instruments and our »Academic Exchange Sino-German Friendship Symposium«, which is now in its 15th year. But far-sightedness also means continuing to develop tried and tested products, while competitors are possibly launching the next »pseudo-development« on the market. At LINK we are very conscious that focusing only on the rear-view mirror at 100 mph cannot be the best way to reach the finishing line.

Enjoy this issue of **directLINK**.
Regards.

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»The knee arthroplasty systems from LINK are very robust« – **Professor Maurilio Marcacci** is head of the 3rd Orthopedic and Traumatology Clinic at the Istituto Ortopedico Rizzoli in Bologna, Italy

»A solution had to be found urgently«

An interview with Professor Maurilio Marcacci, Director of the 3rd Orthopedic and Traumatology Clinic at the Istituto Ortopedico Rizzoli in Bologna, concerning the definitive solution to the problem of metal hypersensitivity, training of young surgeons, and what advances nanotechnology could bring in the field of arthroplasty.

Professor Marcacci, you are the director of a world-renowned orthopedic institute, and you have specialized in knee arthroplasty. When you compare knee replacements in general, what advantages do you see in the products from LINK?
The products from LINK are very robust, which means that, as a surgeon, you know you can trust the prosthetic joint that you are implanting. What I also like about the prosthesis designs from LINK is that they do not follow any fashions. And they deliver what they promise. I know that manufacturers are under pressure to innovate, but LINK sets against this the vast experience it has accumulated over a number of decades. Fortunately, medicine is always put before innovation – and for me, as a surgeon, that is a very important criterion.

You have used LINK implants for eight years now. A short time ago, your clinic changed over completely to knee implants with hypoallergenic surface modification. What made you take this step?
In my clinic, we see that the survival time of an implant is shorter if the patient is hypersensitive to metal. Our experience shows that there are also many patients who suffer unexplained pain which, it may be presumed, is partly of allergenic origin. So we took the view that there was an urgent need to find a solution to the problem of metal hypersensitivity. After all, every patient is entitled to expect us to do our utmost to help him or her. Furthermore, in our experience, surface-modified implants are subject to less abrasion than 'normal' implants.

You then searched for a definitive solution to the problem of metal hypersensitivity – and were successful.
Yes, we decided that, in the future, we would only use surface-modified implants, like the LINK implants with PorEx® surface modification, in our clinic. This enables us to eliminate the risk of an immune reaction triggered by metal hypersensitivity, and at the same time offers the advantage of better implant performance due to lower abrasion. The modified surface functions like a ceramic surface, which is why we use the term 'neo-ceramic'.

»In my clinic, we now only use surface-modified implants.«

Why is it that, today, there are more reasons to use implants with hypoallergenic surface modification than a few years ago?
The number of patients with metal hypersensitivity is constantly increasing, and consequently we know more about this problem than a few years ago. There is often fierce discussion about whether such cases are attributable to metal hypersensitivity or an infection, but the fact is, as a surgeon, you have to act when so many patients are experiencing problems. I expect the debate on this subject to intensify and become more scientifically based.

Is it possible to identify metal hypersensitivity beyond any doubt in every patient?
Not during the course of the operation, and it is also problematic before the surgery. Skin tests are costly and, unfortunately, not as sensitive and reliable as one would wish. But in most cases, one should act if one has reason to suspect a metal hypersensitivity.

Is there a risk of confusion with a periprosthetic infection?
A metal hypersensitivity could be confused with a mild periprosthetic infection. But the main clinical difference between the two is, of course, the presence of microorganisms, although that is not always easy to detect.

Were all patients in your clinic routinely tested for metal hypersensitivity before you made the changeover to hypoallergenic surface modification?
Before the complete changeover, we conducted tests if there was good reason to suspect a metal hypersensitivity. Now that we only use implants with hypoallergenic surface modification, it is no longer necessary. This saves time and reduces costs.

»As a surgeon, you have to act when so many patients are experiencing problems.«

How common are cases of metal hypersensitivity in Italy?
At a rough estimate, around ten percent of all knee arthroplasty patients are hypersensitive to metal – and this number seems to be increasing. Several hospitals in Italy are setting up studies to look into this question. Although one has to ask whether it is really necessary. After all, if hypoallergenic implants are used in every case, the problem is solved, and the tests and studies become superficial.

»Surface-modified implants are subject to less abrasion than 'normal' implants.«

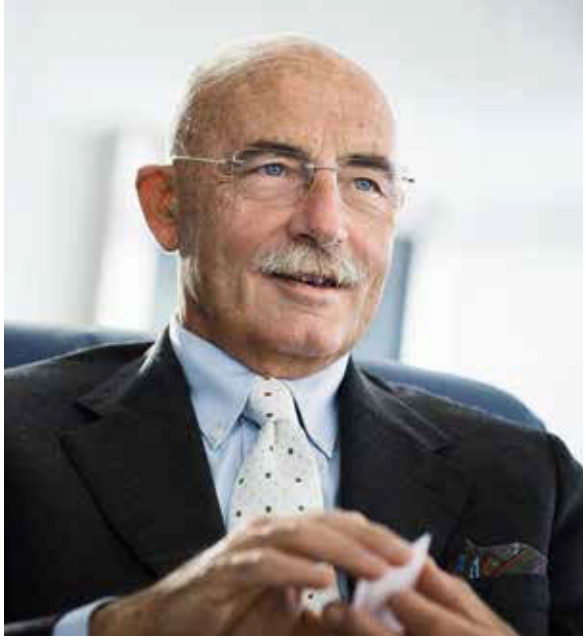
»My personal challenge consists in taking forward useful innovations in orthopedic surgery.«

Prof. Dr. Peter Thomas, a dermatologist at the University of Munich has set up special consultations for patients with a suspected metal hypersensitivity, and attendance has been extremely high. Is the problem of metal hypersensitivity underestimated by surgeons?
A consensus has yet to be reached about the seriousness of the problem in arthroplasty, and whether skin or blood tests are appropriate at all. However, it might be a wise policy to make the use of implants with hypoallergenic surface modification mandatory in order to avoid the problem of metal hypersensitivity, with all its consequences, entirely.

Nanotechnology is one of your special interests. Does the technology have potential for use in arthroplasty one day?
Nanotechnology is relatively new, and it is still largely unknown what applications will be developed in the future. We have yet to fully understand that nanotechnology has the potential to alter the characteristics of tissues and molecules. We are currently investigating the nanocoating of metal and plastic surfaces in order to improve abrasion and resilience, while increasing biocompatibility. It is a very exciting field!

Will we use surface finishes produced using nanotechnology, one day?
Yes, I believe so! In my research group, we have recently extracted nanoparticles from the mineral salts of a bone and integrated them into the surface of plastics. The result is a complete integration of bone and plastic at the anatomical level. It sounds incredible that two solid materials could be completely integrated with each other and form a new material – but that is exactly what makes nanotechnology so special. If this line of research is pursued, perhaps one day this technology will be used for the surfaces of implants.

In your opinion, how will arthroplasty look in ten years time?
I think the design of prosthetic joints will not differ greatly from now. I do not expect any radical changes. In ten years there will probably be different instruments, new anatomic approaches and techniques, but no revolutionary innovations.



»We are investigating the nanocoating of metal and plastic surfaces in order to improve abrasion and resilience.«

You were President of the EFORT Educational Committee for many years. LINK is also active in further professional development for arthroplasty surgeons through the LINKademy. How do you support your young colleagues?
My duty as head of a clinic is to help all the young physicians and students to become the best possible orthopedic surgeons, but at the same time I must respect their individual personalities. Some young colleagues are heavily involved in scientific matters, and some are more interested in the practical side of our specialty. Then there are others again whose principal aim is to become very good physicians. What I can do, and am very pleased to do, is to teach my young colleagues about the foremost duties of a good orthopedic surgeon, and to help them decide what is best for them and their patients.

You are 66 years of age and director of a world-renowned institute. What else would you like to achieve? What are your priorities for the forthcoming years?
If you want to have a fulfilled life, you need a challenge or a dream. My wish for the coming years is to ensure that my successor will carry on the work that I have been doing. I would also like to help with harmonizing and enhancing the training

provided in orthopedics at the European level. My personal challenge consists in taking forward useful innovations in orthopedic surgery. Step by step, and in full awareness that we cannot solve all problems at a stroke.

Professor Marcacci, thank you for talking to us.

Discussion at LINK: (l. to r.) Guido Cometti, CEO of LINK Italia, Professor Maurilio Marcacci, Heike Urbschat from LINK Marketing, and Dr. med. Michael Prang, directLINK editor

The hypoallergenic surface modification PorEx® from LINK

Cementless version of the GEMINI® SL® Total Knee Replacement with TiCaP® coating (light gray) and PorEx® surface modification (gold-colored)

The hypoallergenic surface modification PorEx® from LINK is the ideal solution for patients with suspected metal hypersensitivity. PorEx® reduces the release of allergenic ions by around 95 percent[1]. In addition, it has a low coefficient of friction[2, 3, 4] vis-à-vis polyethylene (UHMWPE) due to its outstanding hardness, ceramic-like abrasion behavior, and optimal wetting angle in contact with liquids. Prosthetic joints with the PorEx® surface modification display optimized sliding and friction properties with a considerable reduction in wear.

PorEx® is a titanium niobium nitride (TiNbN) surface modification which has been in use in Europe for over ten years to give protection against wear and allergies in orthopedic applications. PorEx® surface modification only contains the hypoallergenic elements titanium and niobium, and no chrome or nickel.

In addition to its great hardness, biocompatibility[5, 6, 7], high corrosion resistance[8, 9] and wear protection, PorEx® is also characterized by pronounced adhesive strength and high fatigue strength[10]. The thickness of the PorEx® surface modification is normally 4.5 ± 1.5 µm. In terms of hardness, PorEx® achieves values of approx. 2400 HV (0.1 N), compared to around 550 HV (0.1 N) for CoCrMo alloys. PorEx® surface modification is available for the LINK® GEMINI® SL® Total Knee Replacement, the Unicondylar Sled Prosthesis, and the Endo-Model® Knee Prosthesis. In addition, the LINK® Arthrodesis Nail can be customized with PorEx®. For patients who react hypersensitively to bone cement, LINK offers a custom-made cementless version.

[1–10] Literature available via redaktiondirectLINK@linkhh.de.

»Given the quality of the implants already available today, supposed innovations can easily make things worse instead of better« **Prof. Dr. med. Andreas Niemeier** is Deputy Director of the Department of Orthopedics at the University Medical Center Hamburg-Eppendorf and the Department of Orthopedics and Orthopedic Rheumatology at Bad Bramstedt Medical Center in Germany. He is President of ComGen, the training and research arm of the German Association of Arthroplasty (AE)

»A tried and tested joint prosthesis
in well-trained hands is essentially unbeatable!«

An interview with Prof. Dr. med. Andreas Niemeier about recruitment problems, criticism in the media, and developments in arthroplasty.

Professor Niemeier, what is the present situation with regard to the next generation of orthopedic surgeons specializing in arthroplasty?
Good, I think. Among the various surgical disciplines, we are in a fortunate position because many medical students are interested in orthopedics and traumatology. Some of them then choose arthroplasty as their specialty. Clinics do not have any serious problems in recruiting the next generation of surgeons, provided they have a good location and a good medical reputation. Nevertheless, finding talented young medical professionals is not as easy as it was a few years ago.

Could one reason for this be that many young doctors do not want to work under an administration that is only interested in the economic side of things?
Nobody enjoys working under that sort of administration. If an organization creates a bad climate, the medical staff will be demotivated and will soon leave because there are plenty of alternatives for job seekers. Especially for young doctors who are still training, economic aspects must not intrude too much on their work. However, the administration of a clinic is equally as important as the medical staff. Medical specialists need competent and cooperative partners in administration, and vice versa.

We hear in the media that too many surgical operations are conducted in Germany because of administrative pressure to raise the number of interventions. Is this criticism justified?
In my view, this blanket criticism about arthroplasty has more to do with sensationalism. It is not borne out by the reality. One needs to take a much more discriminating view of the actual situation. In Germany, we are in the fortunate position that everyone who needs a prosthetic joint can receive one within a reasonable period of time. I regard that primarily as a reflection of an efficient healthcare system. In my view, this discussion is not always conducted in the necessary depth in the media. Instead we often get a one-sided polemic, and the accusation that the pursuit of profit gives rise to incorrect treatment decisions.

So is it rather the case that the large number of arthroplasties is attributable to the good orthopedic infrastructure we have in Germany?
That's one reason. The fact that we are able to perform many implants in Germany does not means that this happens without correct indication. Look at Canada, for example. There, the average waiting time for implantation of a joint prosthesis is several months in some regions. Consequently, the Canadian authorities are striving to establish a better infrastructure of arthroplasty specialists so that no patient has to wait longer than six months. This perspective rarely gets mentioned in the media discussion, which is too often negative.

Correct indication and implantation require a high level of training and a great deal of experience.Not every surgeon is able to fulfill these standards.
Every arthroplasty surgeon operates to the best of his or her ability, I'm convinced of that. But it has to be said that this does not automatically mean that the same standard is always attained. In most clinics, there will be a surgeon who occasionally produces a poor outcome, no matter what the level of experience, training, control mechanisms and assistance. That is something one has to accept because any surgeon who believes that everything he ever does is always a huge success is on the way to becoming worse. Arthroplasty requires a lot of knowledge, long training and experience right from the outset. It is our task, as senior physicians, to implement and maintain structures in which as many young colleagues as possible can systematically acquire this experience, and in which they receive the appropriate recognition.

Gender Knee, Deep Flexion Knee and other developments have turned out to be »pseudo-developments« which have not delivered what they promised. Should the ability to recognize potential flops at an early stage be part of the surgeon's training?
Yes, an important aspect of the training is acquiring a fundamental critical faculty. It is a goal of specialist training, both in clinics and in the professional associations, especially the AE (German Arthroplasty Association), that new developments are scrutinized very early on. It is essential to examine where problems could lie, and to do so from a neutral, scientific perspective without any influence from marketing. The findings must then be implemented in the clinics. Ideally, this leads to a mindset where instead of simply following the latest fashion, one first monitors whether the development becomes accepted and established. It is frustrating that some developments in the field of arthroplasty are applied too uncritically.

Does this cautious approach not mean a certain unwillingness to accept innovations?
No, a little more reflection on tried and tested technologies would be a wise move in arthroplasty. An implant that has proved successful in many thousand of patients, especially in the hands of a very experienced surgeon, is extremely hard to beat with any new idea. So both surgeon and patient are well advised to concentrate essentially on products that are known to deliver successful outcomes. On that basis, one can still analyze where problems exist. I'm certainly not saying that all innovations end in failure. Some have been very successful, and therefore have become established, and offer benefits for the patient. I merely wish to warn against rushing to try out every new fashion without careful consideration. Given the quality of the implants we already have at our disposal today, it is easy to make things worse instead of better. Making a good implant even better through innovation is not quite so easy.

You also use implants from LINK in your clinic. What has been your experience?
At our clinic, we have used various LINK products for many years now. One very successful system is the Megasystem-C®, which was co-developed at this clinic by Prof. Lohmann. We introduced the system very early in the development phase, and have been using it routinely ever since, primarily for the reconstruction of relatively serious bone defects of the lower limbs and in revision knee arthroplasty. It is particularly suitable for the reconstruction of major bone defects.

Professor Niemeier, many thanks for giving us this interview.

»Orthopedics and traumatology can be fun!«

An interview with Prof. Dr. med. Georg Matziolis about challenges, career plans and the wider horizon in medicine.

»As medical director, one can try to be as actively involved in the decision-making process as possible« – **Prof. Dr. Georg Matziolis** and a display of the plans for his clinic's new ward block

Professor Matziolis, two years ago you were appointed Medical Director of the Department of Orthopedics and Traumatology at the Waldkrankenhaus Rudolf Elle Eisenberg hospital in Germany, and you also took up the chair of Orthopedics at the Friedrich Schiller University in Jena, Germany. Can you describe a typical working day?

My typical day is very busy and stressful because our clinic has seven orthopedic wards. I start here at 7 a.m., and every minute of the day is planned in detail, as is the entire week. I spend around 30 days each year attending conferences. I also manage to fit in some research, and I usually prepare my lectures on the weekend.

Your previous position was as managing senior physician at the Charité university hospital in Berlin. Were you able to prepare for your new position?

Achieving the balance between patient care and hospital management is a challenge that you can only prepare for to a certain degree. As a senior physician, you naturally grow into these tasks, but for the medical director they take on a different dimension. My employer enabled me to receive coaching, and that was very helpful. Otherwise, I am doing my best to grow into the role by applying common sense and social skills. Now that I have divided my week into clinical days and administration days, it has become considerably easier.

»The old management style doesn't work today.«

What are the medical challenges that you have to face?

Research, teaching and patient care – nothing has really changed there. But the students' expectations have increased significantly. They expect a high quality of teaching – and rightly so, in my view. Another challenge is adjusting to the new generation of staff. The old management style doesn't work today.

What do the hospital owners expect from you as medical director?
Apart from good medical care, they expect the same as any employer: growth. Although, here in Eisenberg we have the advantage that we aren't privatized, so we do not have to record double-digit growth every year. I'm extremely pleased about that because it means I can re-search, teach and care for our patients properly.

As medical director, it is also your job to manage the clinic. Do you also have decision-making powers in administrative matters?
As medical director, one can try to be as actively involved in the decision-making process as possible But in the final analysis, the power to make decisions rests with the person who can control budgets, recruit staff and make investments. From a professional viewpoint, that is how it should be because as a surgeon one is not an experienced manager. However, if medical care suffers because of administrative decisions, then it is imperative to exercise one's veto. Only the physician takes medical decisions! Even if the economic constraints are naturally tighter today.

Talking of constraints, how much does the shortage of physicians affect you in Eisenberg?
It's OK. Our attractive teaching program has enabled us to interest students and young surgeons in our specialty and to keep them. Orthopedics and traumatology can be fun because it is a specialty that can be presented and taught in an exciting way. Instilling this enthusiasm in our students and young colleagues is something I consider to be one of my tasks as medical director.

How do you motivate your team?
When I started here in Eisenberg two years ago, I conducted one-to-one discussions with my staff to establish what their personal goals and expectations were. These conversations were very valuable, so I shall be holding them at regular intervals. I also attach great importance to good, structured CPD (continuing professional development) for my team, also with an eye on the competition. But my young colleagues also need to be optimally positioned for the day when they will perhaps leave us to set up their own practice, or to take up a new position elsewhere.

Has your own career turned out as you originally planned it?
My ambition was always an academic career with research, teaching and patient care, and I have planned my life accordingly. But you can't achieve everything by yourself. You need luck to get the position you would like, to find mentors, and to be successful when you apply for the post of medical director and the professorship.

Presumably it was not possible without sacrifices.
That's true. In the first ten years of my training, I had to work very hard, on both the clinical and the academic side. That meant long hours, working at weekends and sacrificing holidays and leisure time. That's how I managed to acquire the knowledge I needed for my career in a short space of time. I don't think it would have been possible otherwise.

Why did you decide against setting up your own practice?
Because then I would have been very busy with the day-to-day running of the practice, with hardly any time left for research and teaching. I would like to help shape the future of our specialty, to make my mark and be involved with future developments.

Is there anything else that you like to achieve?
Perhaps a sort of fellowship abroad, where I could rotate between different clinics. In that way, one learns a lot about medicine and healthcare systems, and also about the expectations, hopes, plans and goals of patients and physicians.wWidening my horizons beyond the medical world in Germany is an ambition that I would like to fulfill.

Professor Matziolis, many thanks for this interview.

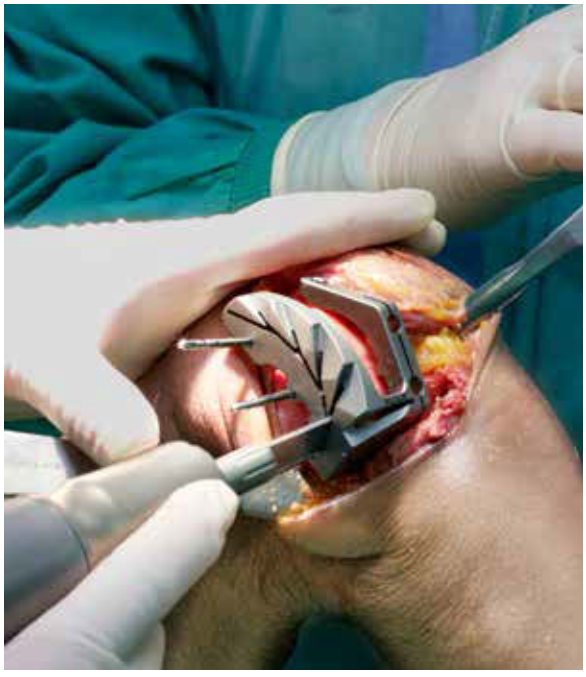
MITUS® RS Resurfacing technique for the Unicondylar Sled Prosthesis

An instrument set which makes implantation of the LINK® Unicondylar Sled Prosthesis easier and safer – the surgical workshop for the MITUS® RS resurfacing technique was held at the Department of Forensic Medicine in Hamburg in July 2014, and the participants were duly impressed.

Expert speakers and a select group at the MITUS® RS surgical workshop: Dr. med. Sascha Thomas, Dr. med. Oliver J. Braunsperger and Dieter Menslage, Helmut D. Link, Prof. Dr. med. Wolfram Thomas and Dr. med. Christoph Sardemann (l to r)

»The new instrument set allows the LINK® Unicondylar Sled Prosthesis to be implanted with great precision, and produces exactly reproducible and stable outcomes«. This is how workshop leader Dr. med. Oliver J. Braunsperger sums up the key advantages of the MITUS® RS Resurfacing technique.

For over a year now, the medical director of the Department of Orthopedics at the Schön Klinik in Vogtareuth, Germany, has used the instrument set for all cases in which implantation of a medial sled is indicated. In the words of Dr. Braunsperger, »This instrument set makes the technique safe and takes us a step closer to a minimally invasive procedure«. But he goes on to add: »A sled is not a procedure for beginners, even with the MITUS® RS Resurfacing technique.« That is why the surgical



»Hands on« at the MITUS® RS workshop for the Unicondylar Sled Prosthesis

workshop, using an anatomically prepared human body, was targeted principally at surgeons who are experienced in knee arthroplasty. The participants were also given a guided tour of the LINK® plant, a talk by Helmut D. Link on the subject of treatment concepts for patients who are sensitive to implant materials, and talks dealing with knee arthroplasty. The small size of the group meant that each participant was able to optimize his knowledge and skills at the operating table, and also had the opportunity to ask questions and discuss at a high level.

»The surgery workshop was very well prepared, and the small size of the group was conducive to lively discussion and interaction« – **Dieter Menslage** is medical director of the Department of Orthopedics at the St. Elisabeth Hospital in Damme

Workshop leader: **Dr. med. Oliver J. Braunsperger**

»The discussions went far beyond the fundamentals« – **Dr. med. Sascha Thomas** is senior physician at the European Hospital in Rome

»The surgery workshop is ideal for surgeons who are experienced in knee arthroplasty« – **Dr. med. Christoph Sardemann** is deputy medical director of the Department of Orthopedics at the St. Vinzenz Hospital in Düsseldorf

»The communication between colleagues was at a very high level« – **Prof. Dr. med. Dr. Wolfram Thomas** is Director of Joint Surgery at the European Hospital in Rome

LINKademy Events 2014

(Registration at www.linkademy.de)

Date	Type	Title/Speaker	Venue
Nov. 14-15, 2014	Instrumentation course	REVEASE surgery workshop for revision arthroplasty (national) Speakers: Nurse Jutta Koch, Nurse Helga Lohmann	Maritim Hotel Magdeburg
Nov. 27–28, 2014	Symposium	LINKademy® International Revision Symposium Speaker: Prof. Dr. med. Thorsten Gehrke	Berlin
Dec. 17–18, 2014	Hands-on workshop	LINKademy® Unicondylar Sled – hands-on workshop (national) Speaker: Mr. Sean O´Leary	UKE (University Medical Center) Hamburg

LINK® Academic Exchange Sino-German Friendship Symposium in its 15th year

The LINK® Academic Sino-German Friendship Symposium celebrates its 15th anniversary this year. To mark the occasion, LINK and its Chinese partner NATON invited a delegation of 25 Chinese orthopedic surgeons to Germany. In addition to an exchange of medical expertise, the guests also enjoyed a reception at the Hamburg City Hall.

The guests from China in the garden of the Diakonie Hospital in Bad Kreuznach

The Academic Sino-German Friendship Symposium was established by LINK in 1998 and has been an enormous success. In the words of Bülent Topal, LINK Export Manager, »LINK is market leader in China with its implants. The good long-term outcomes have been instrumental in creating an excellent reputation for German medical technology. Through the academic exchange of knowledge between German and Chinese surgeons, we are expanding our contacts still further«. Since the first Symposium was held in 1998, up to 300 orthopedic surgeons from China have visited Germany each year through LINK's initiative. During their visit, German surgeons provide their Chinese counterparts with instruction in surgical techniques and special measures such as control of infections. »The exchange of know-how between surgeons means that we are helping to further the advance of arthroplasty in China, for the benefit of patients«, explains proprietor Helmut D. Link. »Many surgeons who came to Germany for the first time 15 years go now hold important positions at universities and major hospitals in China.«

The 15th Academic Sino-German Friendship Symposium, held in July 2014, was once again all about academic knowledge transfer. The program lasted several days and included talks by experienced German arthroplasty surgeons plus workshops and live operations in cooperation with the HELIOS ENDO-Klinik in Hamburg, the Diakonie Hospital in Bad Kreuznach and the Lubinus Clinic in Kiel, Germany.

Helmut D. Link presents a gold-colored hip prosthesis to Yingzhao Lin, director of LINK's Chinese partner NATON Medical Group, as a token of esteem

(l to r) Dr. Zhu Yong (Department of Orthopedics, Xiangya Hospital, Central-South University, Changsha), Helmut D. Link, Elke Badde (State Councilor at the Health and Consumer Protection Authority) and NATON Medical Group chief executive Yingzhao Lin in the »Bürgermeistersaal« of Hamburg City Hall

»We are **successful** because we are able to **help patients.«**

Mr Lin, in 1995 you founded the NATON Medical Group, and you are its chief executive. Since 1996 you have been working very successfully with LINK. What are the factors behind your joint success in China?

LINK and NATON have similar philosophies. Ever since the collaboration began, both companies have focused on the well-being of patients, and not just on the business. For example, we devote special attention to an excellent standard of continuous training for surgeons and very good surgical outcomes. We are so successful in China because our goal is to help patients, and we have the ability to achieve that goal.

Which LINK implants are particularly successful in China?

We have many implants that are very successful. For example, the LINK® RIBBED® Hip Prosthesis Stem and the LINK® GEMINI® MK II Total Knee Replacement System, which both offer outstanding design and are also very forgiving of mistakes by the surgeon. But the success of LINK implants in China is also attributable to the training provided by LINK in China, and not only for young surgeons.

NATON is the biggest orthopedic corporation in China. How do you regard the future of the collaboration with LINK?

Together we will continue to grow because we have an excellent understanding. We also have a very good 500-strong sales team and an enormous market capacity for prosthetic implants – China has a population of 1.3 billion. I'm very satisfied with what we've achieved up to now, and I look forward to a successful future with LINK.

Mr Lin, many thanks for this interview.

New product

Anatomically adapted, cementless
The new SP-CL® Hip System from LINK

LINK has decades of experience in the design of anatomically adapted joint prostheses, and has applied this vast experience in the development of a new implant system based on a tried and tested concept: the new, anatomically adapted cementless hip system**SP-CL®**.

Uniform stress distribution by means of an anatomically adapted stem design. The visualization shows that adapting the hip stems to the anatomy of the femur produces a more uniform stress distribution, thereby eliminating harmful focal stress concentrations, which can also trigger upper leg pain in the case of press-fit stems.

The new, cementless SP-CL® Hip System is a further development of the cemented anatomical SP II® Hip System, whose success has been verified for decades in clinical studies[1] and registers. Development of the SP-CL® System required detailed biomechanical testing of the anatomic design features of the SP II® prosthesis on numerous specimens, and with imaging methods, to enable adaptation to cementless fixation. State-of-the-art design and fabrication techniques produce a harmonious prosthesis system which promises highly reproducible clinical outcomes.

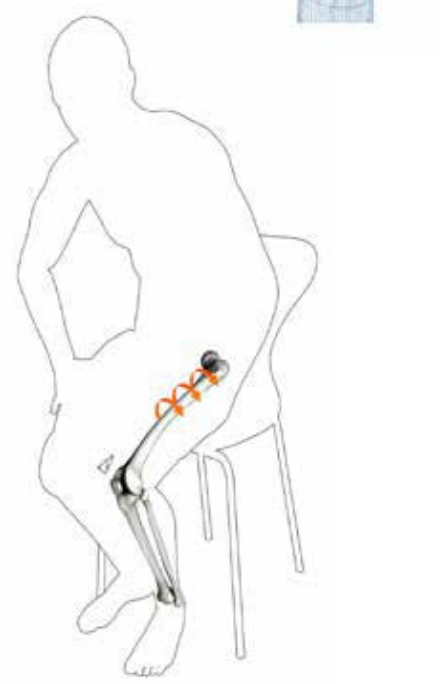
A flattened lateral profile permits minimally invasive, trochanter-conserving implantation

The anatomic, cementless prosthesis design and the various versions of the SP-CL® mean that this prosthesis principally fulfills the high demands made on arthroplasties in patients with good bone mass. Thus the s-shaped stem and integrated anteversion of the prosthesis largely compensate for the axial and rotational forces, while also giving a high degree of stability and a large range of movement (ROM) in the joint. The requirement for minimally invasive, conservative implantation is met by the flattened, trochanter-conserving lateral profile and the use of cancellous bone compressors to conserve bone substance.

Compact and ergonomic instrument set for effective, smooth surgical procedure

The pronounced ribbed profile and the LINK® Tilastan®-S alloy give the stem a high level of structural and material-based elasticity compared to other systems. This, in turn, produces superior primary stability and neutralizes the stress shielding because stiffening of the femur is significantly reduced, and the bilateral cancellous bone plays a major part in the distribution of forces. The desired secondary metaphyseal fixation of the SP-CL® is

[1] e.g. the Swedish Hip Arthroplasty Register, www.shpr.se.



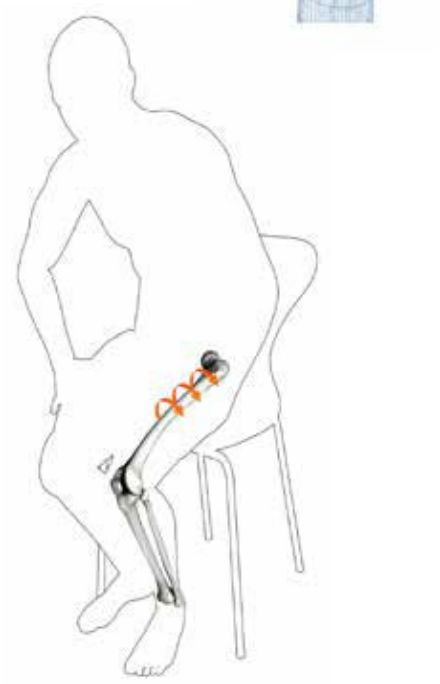
The main advantage of the s-shaped stem of the SP-CL® prosthesis is that the dorsal axis of rotation lies outside the curved neutral axis of the stem when pressure is exerted on the anterior prosthesis head during load transmission. This means that the shape of the prosthesis minimizes harmful torsional forces, which are the main cause of aseptic loosening (see the graphic).

promoted by HX®-coated (CaP) versions and the atraumatic, polished distal stem region, which enables diaphyseal articulation. Medially, a significant length of the SP-CL® is supported at the Shenton's line, and thus ensures a physiologic load transfer. Two CCD angles allow excellent adaptation to the anatomy.

The prosthesis stems of the SP-CL® system are fitted with 12/14 cones and can be combined with all the modular ceramic and metal prosthesis heads from LINK. The neck section of the SP-CL® is flattened and tapered, which has a beneficial effect on the ROM. The compact, ergonomic instrument set for the SP-CL® permits efficient, smooth surgical procedure, while the the modular design keeps the system streamlined. In summary, the key features of the cementless SP-CL® Hip System are:

- Anatomic design with 5° antetorsion
- Flattened lateral profile to conserve the greater trochanter
- Metaphyseal, cementless fixation
- Minimal bone resection
- Ribbed profile for outstanding primary stability and integration of the proximal femur into the distribution of forces
- 15 sizes each in the left and right leg versions
- Two CCD angles: 135° and 126°
- Harmonious progression in size and offset
- Rounded, polished distal stem region
- Tried and tested surface coating: LINK® HX® (CaP)

Video interview with the co-developer of the **SP-CL®**, Prof. Dr. Thorsten Gehrke. Scan the QR code.
Or go to www.sp-cl.de.



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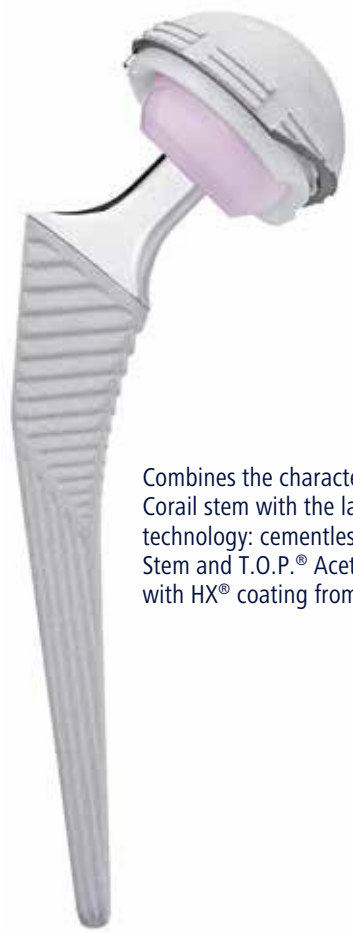
LCU® Hip Stem: **Rapid osseointegration** thanks to **LINK® HX® coating**

Ideal for minimally invasive surgical techniques; effective conservation of the ridge of the trochanter; LINK® HX® coating for rapid osseointegration. The cementless LCU® Hip Stem from LINK combines the characteristics of the Corail stem with the latest coating technology. Various offset versions and well-considered size increments enable adaptation to virtually any anatomy.

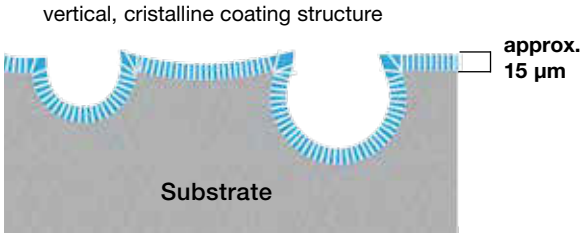
The straight stem of the LCU® Hip Prosthesis System is made of Tilastan-S® (TiAL6V4 forged alloy) and has a double-conical shape. The straight profile with rectangular cross-section lends the implant proximal stability. The osteoconductive HX® coating ensures rapid osseointegration. Two stem types, each in eleven sizes, with a uniform, microroughened surface for optimal osseointegration, allow ideal adaptation to the patient's anatomy.

The key features of the LCU® Hip Prosthesis Stem are:

- LINK® HX® coating for rapid osseointegration
- Ideal for minimally invasive surgical techniques
- Flattened profile helps greatly to conserve the ridge of the trochanter
- Short cone and flattened neck section for greater ROM and minimized impingement risk
- Cancellous bone compression conserves bone
- Maximum support along a considerable length of the Shenton's line
- Pronounced metaphyseal wedge of approx. 4°
- Proximal and distal ribbing for good support and resistance to rotation
- Highly osteoconductive, rapidly soluble, stable HX® coating (CaP)
- Clinical experience and documentation of the underlying stem concept with outstanding survival rates
- Suitable for almost all conventional surgical approaches
- Stem made of TiAL6V4 forged alloy; design based on the Corail principle
- Versions: standard and lateralizing (high offset), sizes 8–16, 18, 20



Combines the characteristics of the Corail stem with the latest coating technology: cementless LCU® Hip Stem and T.O.P.® Acetabular Cup with HX® coating from LINK



The 15 µm thick microfine LINK HX® calcium phosphate coating promotes rapid bone ingrowth into the surface structure of the prosthesis, thereby creating long-term fixation. The special electrochemical process gives the coating exceptional mechanical strength.

Optimized bone screws
for the new LINK® T.O.P.® II Acetabular Cup System

Optimal fixation, assembly and stability – the LINK® T.O.P.® II Acetabular Cup System is the latest generation of cementless press-fit cups. One of the key features is that the bone screws are inserted at an angle and are designed with a deeper thread, a more slender neck and a spherical contact surface below the screw head. A pivoting angle in the acetabular cup of 7.5° to each side (see below) facilitates fixation in the best possible bone substance. Furthermore, the minimum wall thickness of the cup has been increased from 2 mm to 3 mm, and the range of sizes has been reduced from 15 to 14. The T.O.P.® II Acetabular Cup System begins at size 42. An enlarged impactor receptacle makes for improved driving in and better directing of the metal casing.

The mediocaudal recess in the T.O.P.® II protects the femoral nerve and psoas tendon against trauma caused by the acetabular cup rim, while also preserving a wide ROM. The optimized polyetylene inserts (standard UHMWPE and X-LINKed® – cross-linked UHMWPE) are available in standard and anti-luxation designs. Both versions are inserted into the cup, secured against rotation, and optimally oriented for each patient.

The key features of the new LINK® T.O.P.® II Acetabular Cup System are:

- Optimized screw holes for better fixation
- Press-fit cup with two PE options (standard and anti-luxation)
- 14 sizes, made of Tilastan® (titanium alloy)
- Mediocaudal recess protects femoral nerve and psoas tendon
- Subhemispherical and with flattened pole for maximum bone conservation
- Circumferential ribs for reliable primary stability
- LINK® HX® coating for biologic long-term anchoring
- Specialized cup type (PE, X-PE) for cost-effective implantation (e.g. with LINK® LCU®)

Optimized screw holes improve the fixation by ensuring that the screws are more precisely directed to the optimal bone substance: the new LINK® T.O.P.® II Acetabular Cup System

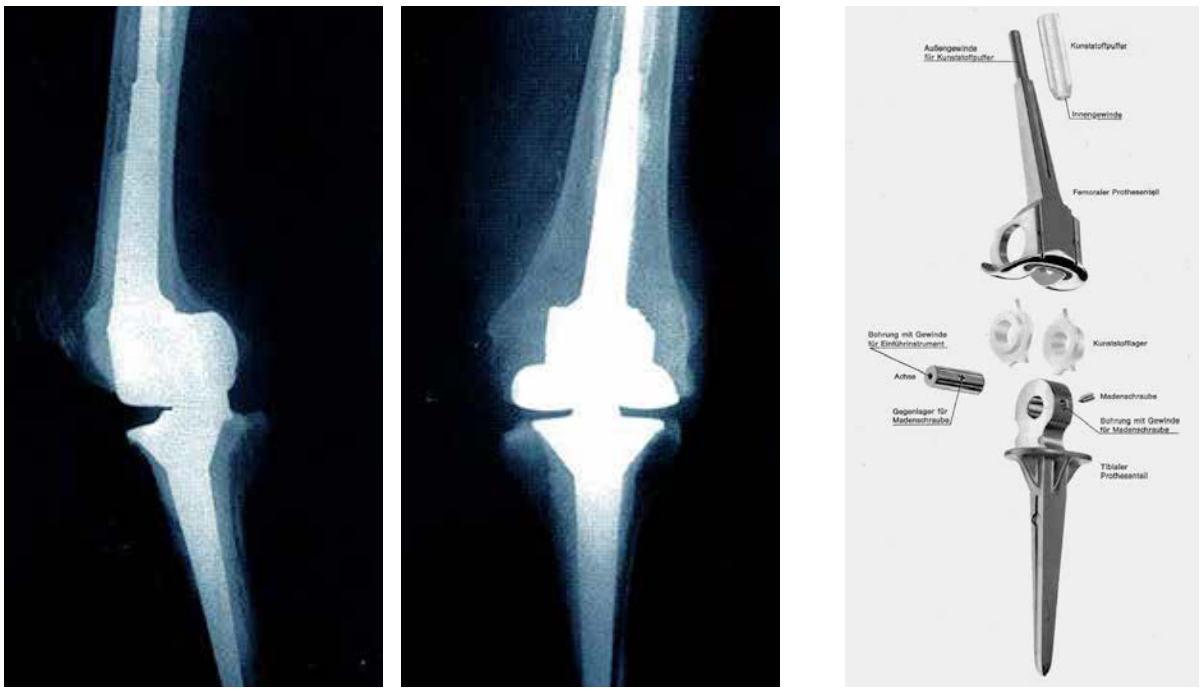
35 years in situ: LINK supplies original spare parts for 35-year-old **St. George®** knee joint prosthesis

A patient who is now 68 years old received a St. George® knee joint prosthesis from LINK back in 1979. In March 2014, the implant had to be revised to rectify wear to the polyethylene. LINK was able to supply the original spare parts. A case study.

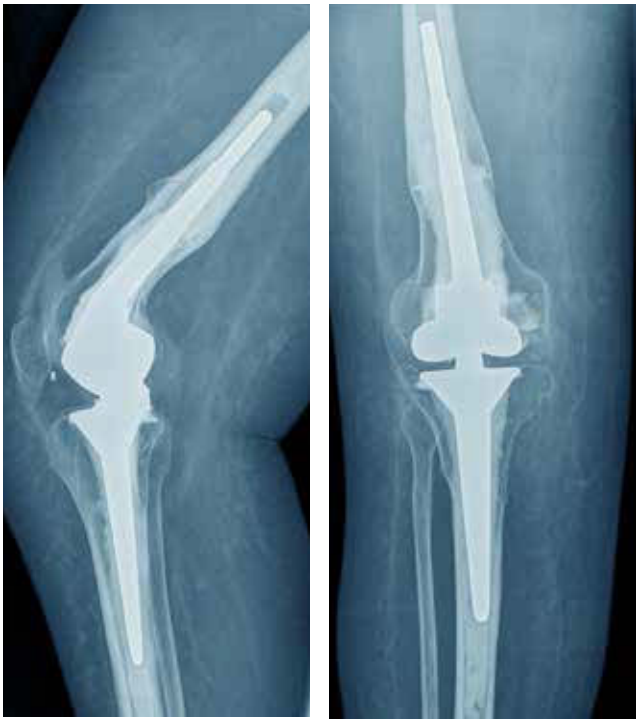
In 1979, a 35-year-old patient was given a St. George® knee joint prosthesis (valgus model) due to poliomyletis with consecutive knee dysplasia, pronounced ligament instability, and the aftermath of supracondylar tibial realignment in the right leg. According to the surgical report, the cartilage situation in the medial knee region was normal, while a slight change in the cartilage situation was diagnosed in the region of the femoral and tibial condyles. The cruciate ligaments were described as worn and thin.

The St. George® knee joint prosthesis is still absolutely secure after 35 years.

The patient herself stated that she had never experienced any problems with the implant. However, she did report excessive deflection in the knee joint, which she perceived as instability. Consequently, in the spring of 2014, a revision of the St. George® knee joint prosthesis was performed. Intraoperatively, the St. George® prosthesis was found to be normally positioned and displaying minor metal abrasion, thin, cracked polyethylene and worn plastic bearing surfaces. The polyethylene bearing shells and one set screw were replaced. In addition, the femoral component was built up with cement at the level of the condylar groove, and the thin patellar tendon



Postoperative radiographs from 1979 (left and center); diagram of the St. George® knee prosthesis of 1979 (right)



Preoperative radiographs from January 2014

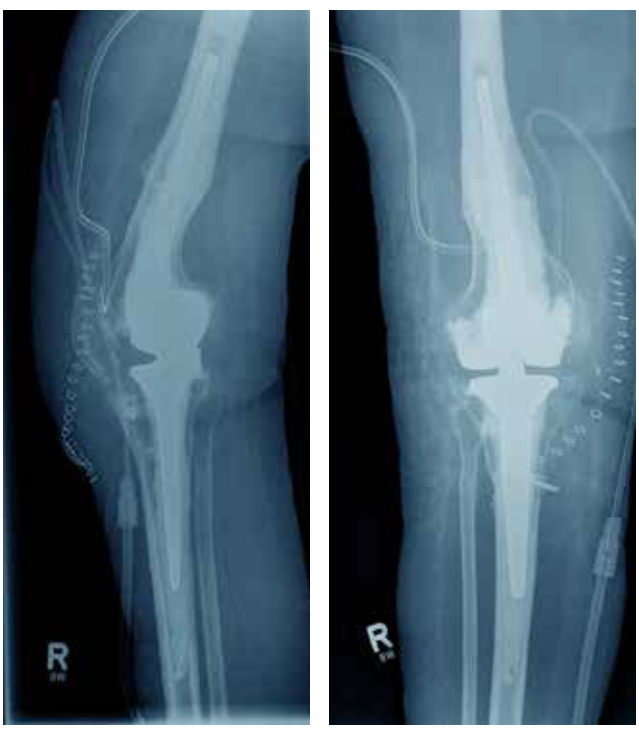
was refixed. The firmly seated femoral and tibial components were left in situ.

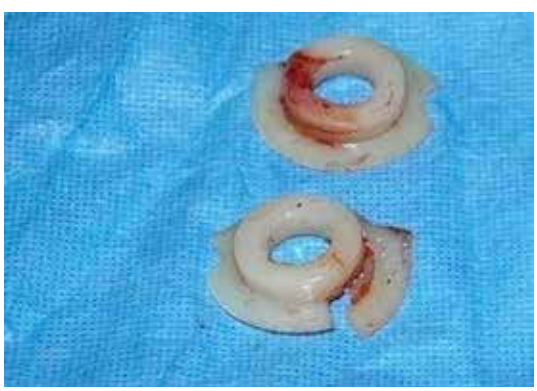
On the first day postop, the patient was mobilized in the clinic corridor, during which she was able to fully load the affected limb. A microbiologic smear was negative, and subsequently there was soft tissue swelling with normal CRP. The patient received further conservative treatment on account of a relatively large hematoma.

LINK supplies original spare parts for the 35-year-old St. George® knee joint prosthesis

At a follow-up examination two months post-op, the patient was able to flex and extend the leg fully. In August 2014, she reported that she was well. Disregarding some slight swelling, she felt that she had regained stability in the affected leg.

N.B.: LINK was able to supply replacements for all the parts originally used because the company still has complete documentation of the St. George® knee joint prosthesis implanted in 1979.





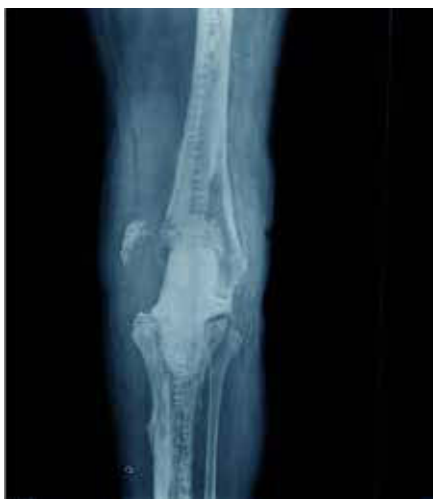
Postoperative radiographs from March 2014 (left and center); 35-year-old polyethylene bearings after removal

LINK® Megasystem-C®: **Joint preservation** in a case of **periprosthetic infection,** knee arthrodesis and massive bone loss

How is it possible to avoid the hip and ankle joints being affected in spite of knee arthrodesis and massive bone loss? A case report provided by Prof. Luis Bahamonde, Director of the Department of Orthopedic Surgery and Traumatology at the Universidad de Chile, who specializes in traumatology and tumor surgery.

INTRODUCTION: Knee arthrodesis is a limb-preservation technique for conservative technique for patients with irreparable loss of knee function. Frequent indications are failed arthroplasty due to periprosthetic infection, trauma with massive bone loss and an irreparable damage to the extension apparatus. The traditional technique requires sufficient bone-to-bone contact between the distal femur and proximal tibia, but this is not possible in the case of massive bone loss. The author presents the case of a knee arthrodesis with the LINK® Megasystem-C® in a patient with massive bone loss following periprosthetic infection resulting from implantation of a hinge knee prosthesis.

Implantation of Endo-Model® from LINK



Failed knee revision due to periprosthetic infection. The radiograph shows the serious bone loss and cement spacer. Cement residues and infected bone necessitated further, extensive bone resection on femur and tibia.

CASE STUDY: A 55-year-old man with an open tibial head fracture of the left leg, with adequate soft tissue, was first treated with an external fix-ator and secondary open reduction and fixation. The follow-up revealed an infected pseudarthrosis and collapse in varus. Surgical debridement was performed, and the old material removed. In addition, antibiotic beads were inserted and systemic antibiotic therapy was initiated. After six months (three weeks after discontinuation of the systemic antibiotic therapy), it was possible to implant a LINK® Endo-Model® Knee Prosthesis, with normal inflammation markers.

LINK® Megasystem-C® as diaphyseal replacement

Subsequently, a secondary infection developed, which necessitated removal of the prosthesis and insertion of an antibiotic spacer with gentamicin- and vancomycin-impregnated cement. Eight months after the intervention, it was decided that, given normal serum markers and healed soft tissue coverage, a knee arthrodesis nail should be implanted as an alternative to amputation. As there was no adequate bone-to-bone contact between distal femur and proximal tibia, the LINK® Megasystem-C® was chosen for the diaphyseal replacement. Intraoperatively, further bone was resected from the distal end of the femur and the proximal end of the tibia in order to remove remnants of cement and to minimize the risk of reinfection. A patellectomy was also performed.

The patient is almost pain-free and mobile with a walking aid

The LINK® Megasystem-C® in situ. Also visible are the intermediate modules, which were implanted to achieve the optimal length and the secured coupling system. Cementless conical stems were anchored in the distal femur and in the proximal tibia.

Mobile with a walking aid. The follow-up radiograph shows only minimal shortening of the left leg and stable construction of the knee arthrodesis.

The diaphyseal skeletal reconstruction required the use of LINK® Megasystem-C® implants. Both the proximal and distal segments were connected with cementless conical stems and anchored in the diaphyses of femur and tibia. Special care was taken to ensure correct torsional alignment of the limb so that the central coupling mechanism could be optimally positioned for final connection of the femoral and tibial components. Postoperatively, rehabilitation of the patient began immediately with partial loading. The follow-up after eight months revealed no signs of infection. The patient reported slight pain, which was treated with non-narcotic oral medication.

LINK® Megasystem-C® – an alternative to knee arthrodesis following massive bone loss

COMMENT: In this and two other cases of massive bone loss with no possibility of bone-to-bone contact between tibia and femur, the LINK® Megasystem-C® was implanted for skeletal reconstruction as an alternative to amputation and osseous arthrodesis. The versatility of the system and the intelligent central coupling mechanism enabled satisfactory reconstruction and immediate restoration of stability and function in the limb. Prof. Luis Bahamonde therefore considers the LINK® Megasystem-C® to be a good alternative to knee arthrodesis following massive bone loss due to infection or trauma. This applies when there is no possibility of bone-to-bone contact between tibia and femur.

N.B.: In the case described, the knee arthrodesis was performed with a straight diaphyseal spacer, and the hip and knee joints were unaffected. The modularity of the LINK® Megasystem-C® means that it also offers valgization components and components for a total femur replacement.

10-year follow-up: very good results for the **cemented SP II®** **130 mm stem** from LINK

The cemented LINK® SP II® 130 mm long stem achieves very good results in the 10-year follow-up. This is confirmed by a retrospective cohort study from 2013[1]. No data had previously been published on the »short« 130 mm stem.

This study from the Netherlands evaluated 829 patients (932 hips) who received a total hip replacement with a 130 mm SP II® femoral component between 1996 and 2001. The average patient age was 72.3 years, and the average follow-up period ten years. The primary end point was a revision.

The survival rate analysis showed a 10-year survival of the SP II® 130 mm stem of 98.7 percent (95 percent CI: 99.7-97.7) and a 10-year survival of the hip prosthesis of 98.3 percent (95 percent CI: 99.3-97.3).

Potential advantages with the SP II® 130 mm stem from LINK

The results show that very good long-term outcomes are achieved with the 130 mm stem of the cemented SP II® Hip Prosthesis. Although 150 mm and 170 mm stems are the most frequently used worldwide, the 130 mm stem offers potential advantages over both. These advantages are increased distal bone conservation and easier removal – the latter offering good options in the event of a revision.

The anatomically shaped SP II® Stem is well documented in the arthroplasty registers and in clinical studies. It allows a uniform cement mantle around the prosthesis, which reduces the risk of cement fracture between prosthesis and bone, and may be assumed to increase the survival rate of the prosthesis[2]. For the 150 mm and 170 mm stems, survival rates of between 90 and 98 percent are quoted, with a follow-up period of at least 10 years[3]. The data from the Swedish Hip Arthroplasty Register[4] is almost entirely consistent at >98 percent in relation to the 150 mm stem. The current study confirms that the long-term survival rate of the SP II® 130 mm stem does not differ from the 150 mm and 170 mm stems.

[1] Wybren Prins, Remco Meijer, Boudewijn J Kollen, Cees CPM Verheyen, Harmen B Ettema: Excellent results with the cemented Lubinus SP II 130-mm femoral stem at 10 years of follow-up (932 hips followed for 5–15 years); Acta Orthopaedica 2014
[2] Lubinus et al. 2002
[3] Annaratone et al., 2000, Lubinus et al. 2002, Catani et al. 2005, Mäkelä et al. 2008, Espehaug et al. 2009 Wierer et al. 2013
[4] The Swedish Hip Arthroplasty Register 2013, www.shpr.se

SP II® Hip Prosthesis Stem from LINK in the lengths 130 mm, 150 mm and 170 mm (l to r)

Traumatology: **Megaprostheses** suitable for treatment of **major bone defects**

Megaprostheses like the LINK® Megasystem-C® provide orthopedic oncology surgeons and also traumatologists with a valuable tool for restoring limb functionality in patients with major bone defects. This is the conclusion reached by a current retrospective study from Italy[1].

The development of megaprostheses for the treatment of major bone defects also gives orthopedic traumatologists important options for the replacement of skeletal segments, such as the long bones of the upper and lower limbs and the adjoining joints. This can be regarded as a measure that rapidly restores quality of life, compared to long-term osteosynthesis procedures or negative prognoses for bone transplants. In their study, the authors retrospectively assessed clinical and radiological results in patients who had previouslyhad a megaprosthesis implanted in a lower limb.

Encouraging clinical results

For the study, 32 patients in whom mono- and biarticular megaprostheses had been implanted underwent a clinical and radiological follow-up of 18 months on average. The first patients participaing in the study were observed for five years, and the clinical results were encouraging. These patients displayed good articulation of the joints without any somato-sensory or motor deficits, and acceptable functional recovery.

The authors conclude from this that megaprostheses offer an option for orthopedic traumatologists in cases of massive bone loss and primary or secondary prosthesis failure. However, the high mortality rate in oncology patients has so far excluded long-term follow-up documentation in oncologic use. It is not yet possible to make any definite statement concerning the survival rate of this type of prosthesis when used in traumatology, or to provide results on medium- to long-term complications.

Encouraging clinical results also in traumatology:
LINK® Megasystem-C® modular tumor and revision system

[1]Calori GM, Colombo M, Ripamonti C, Malagoli E, Mazza E, Fadigati P, Bucci M.: Megaprosthesis in large bone defects: opportunity or chimaera?; Injury. 2014 Feb;45(2):388-93. doi: 10.1016/j.injury.2013.09.015. Epub 2013 Sep 21

Focus on periprosthetic infections:
LINKademy® International Revision Symposium 2014

The treatment of periprosthetic infections will be the focus of the International Revision Symposium at the LINKademy® in Berlin, on November 27 and 28, 2014. The speakers again include numerous nationally and internationally renowned revision experts.

The aim of the Symposium is to develop solutions for difficult knee and hip arthroplasty revisions on the basis of scientific facts; to reach a consensus and derive therapy algorithms.

Following the extremely positive reactions to last year's event, the 2014 Symposium will again have a very interactive character. Prof. Dr. med. Thorsten Gehrke will chair the Symposium and, as moderator, will ensure that all the participants and experts are continuously involved in the discussions, and that their individual fields of interest are given due consideration. To this end, each subject will be presented by referencing a real case, and then intensive discussion will follow. The aim is to conclude each case by coming up with a specific solution and deriving a treatment algorithm.

Registration is via www.linkademy.de.

Hip and knee experts at the
2nd LINKademy® Latin America Symposium in Columbia

170 hip and knee experts from Latin America took part in the 2nd LINKademy® Latin America Symposium »Modular Systems and Megaprostheses: solutions for reconstructive hip and knee surgery« in Cartagena, Columbia, in August 2014. The LINKademy® staged the Symposium in collaboration with LINK distributor Disortho, SA de CV. The discussion centered on five revision cases and the solutions employed. Dr. Javier Pérez from Hospital Universitario Clínica San Rafael in Bogotá, Columbia, summed up: »The quality of the cases and discussions was exceptional. We are pleased to be able to treat our patients with LINK products which offer top quality and functionality«. The next LINKademy® Latin America Symposium will be held in Cartagena, Columbia on August 6, 2015.

High standards for applicants

The trainees at LINK work closely with their instructors. The personal relationship is characterized by open doors, regular discussions and a cooperative approach. The standards are high: all applicants for a traineeship at LINK must demonstrate proficiency in mathematics and physics. Reliability, punctuality and teamworking skills are obligatory.

The real thing

At the plant, trainees soon find themselves working on real LINK products, under supervision. All trainees gain experience in every production department, and acquire skills ranging from operation of the latest computer-controlled machines through to simple measuring instruments such as calipers. Here a trainee is checking a LINK® Megasystem-C® proximal tibial replacement, manufactured from solid material.

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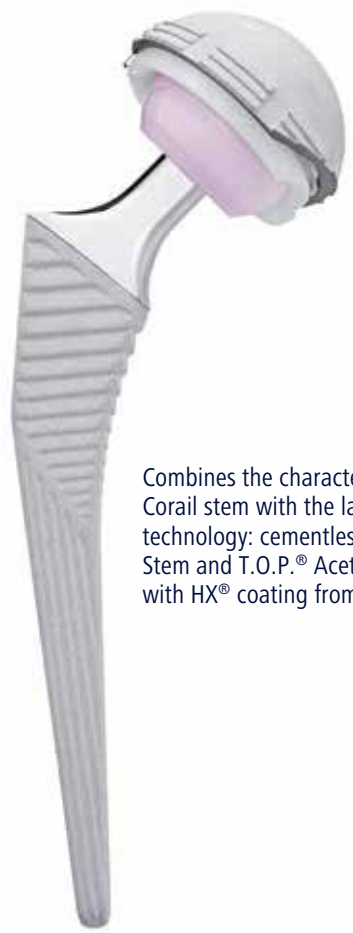

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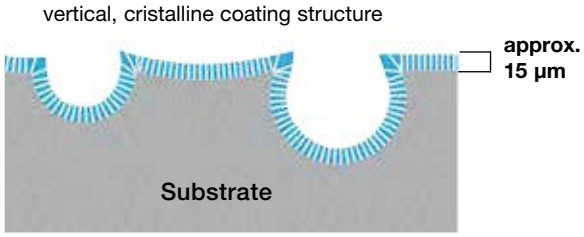

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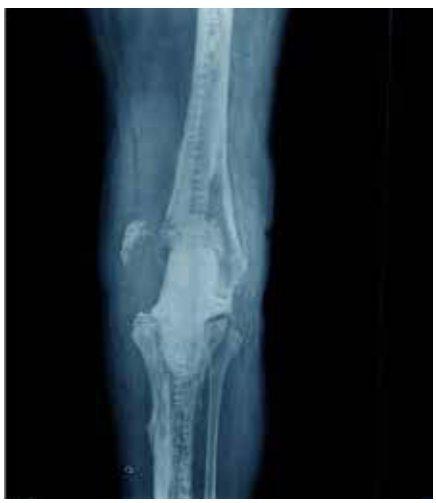
INTRODUCTION: Knee arthrodesis is a limb-preservation technique for conservative technique for patients with irreparable loss of knee function. Frequent indications are failed arthroplasty due to periprosthetic infection, trauma with massive bone loss and an irreparable damage to the extension apparatus. The traditional technique requires sufficient bone-to-bone contact between the distal femur and proximal tibia, but this is not possible in the case of massive bone loss. The author presents the case of a knee arthrodesis with the LINK® Megasystem-C® in a patient with massive bone loss following periprosthetic infection resulting from implantation of a hinge knee prosthesis.

Implantation of Endo-Model® from LINK



Failed knee revision due to periprosthetic infection. The radiograph shows the serious bone loss and cement spacer. Cement residues and infected bone necessitated further, extensive bone resection on femur and tibia.

CASE STUDY: A 55-year-old man with an open tibial head fracture of the left leg, with adequate soft tissue, was first treated with an external fix-ator and secondary open reduction and fixation. The follow-up revealed an infected pseudarthrosis and collapse in varus. Surgical debridement was performed, and the old material removed. In addition, antibiotic beads were inserted and systemic antibiotic therapy was initiated. After six months (three weeks after discontinuation of the systemic antibiotic therapy), it was possible to implant a LINK® Endo-Model® Knee Prosthesis, with normal inflammation markers.

LINK® Megasystem-C® as diaphyseal replacement

Subsequently, a secondary infection developed, which necessitated removal of the prosthesis and insertion of an antibiotic spacer with gentamicin- and vancomycin-impregnated cement. Eight months after the intervention, it was decided that, given normal serum markers and healed soft tissue coverage, a knee arthrodesis nail should be implanted as an alternative to amputation. As there was no adequate bone-to-bone contact between distal femur and proximal tibia, the LINK® Megasystem-C® was chosen for the diaphyseal replacement. Intraoperatively, further bone was resected from the distal end of the femur and the proximal end of the tibia in order to remove remnants of cement and to minimize the risk of reinfection. A patellectomy was also performed.

The patient is almost pain-free and mobile with a walking aid

10-year follow-up: very good results for the **cemented SP II®** **130 mm stem** from LINK

The cemented LINK® SP II® 130 mm long stem achieves very good results in the 10-year follow-up. This is confirmed by a retrospective cohort study from 2013[1]. No data had previously been published on the »short« 130 mm stem.

This study from the Netherlands evaluated 829 patients (932 hips) who received a total hip replacement with a 130 mm SP II® femoral component between 1996 and 2001. The average patient age was 72.3 years, and the average follow-up period ten years. The primary end point was a revision.

The survival rate analysis showed a 10-year survival of the SP II® 130 mm stem of 98.7 percent (95 percent CI: 99.7-97.7) and a 10-year survival of the hip prosthesis of 98.3 percent (95 percent CI: 99.3-97.3).

Potential advantages with the SP II® 130 mm stem from LINK

The results show that very good long-term outcomes are achieved with the 130 mm stem of the cemented SP II® Hip Prosthesis. Although 150 mm and 170 mm stems are the most frequently used worldwide, the 130 mm stem offers potential advantages over both. These advantages are increased distal bone conservation and easier removal – the latter offering good options in the event of a revision.

The anatomically shaped SP II® Stem is well documented in the arthroplasty registers and in clinical studies. It allows a uniform cement mantle around the prosthesis, which reduces the risk of cement fracture between prosthesis and bone, and may be assumed to increase the survival rate of the prosthesis[2]. For the 150 mm and 170 mm stems, survival rates of between 90 and 98 percent are quoted, with a follow-up period of at least 10 years[3]. The data from the Swedish Hip Arthroplasty Register[4] is almost entirely consistent at >98 percent in relation to the 150 mm stem. The current study confirms that the long-term survival rate of the SP II® 130 mm stem does not differ from the 150 mm and 170 mm stems.

[1] Wybren Prins, Remco Meijer, Boudewijn J Kollen, Cees CPM Verheyen, Harmen B Ettema: Excellent results with the cemented Lubinus SP II 130-mm femoral stem at 10 years of follow-up (932 hips followed for 5–15 years); Acta Orthopaedica 2014
[2] Lubinus et al. 2002
[3] Annaratone et al., 2000, Lubinus et al. 2002, Catani et al. 2005, Mäkelä et al. 2008, Espehaug et al. 2009 Wierer et al. 2013
[4] The Swedish Hip Arthroplasty Register 2013, www.shpr.se

SP II® Hip Prosthesis Stem from LINK in the lengths 130 mm, 150 mm and 170 mm (l to r)

High standards for applicants

The trainees at LINK work closely with their instructors. The personal relationship is characterized by open doors, regular discussions and a cooperative approach. The standards are high: all applicants for a traineeship at LINK must demonstrate proficiency in mathematics and physics. Reliability, punctuality and teamworking skills are obligatory.

The real thing

At the plant, trainees soon find themselves working on real LINK products, under supervision. All trainees gain experience in every production department, and acquire skills ranging from operation of the latest computer-controlled machines through to simple measuring instruments such as calipers. Here a trainee is checking a LINK® Megasystem-C® proximal tibial replacement, manufactured from solid material.