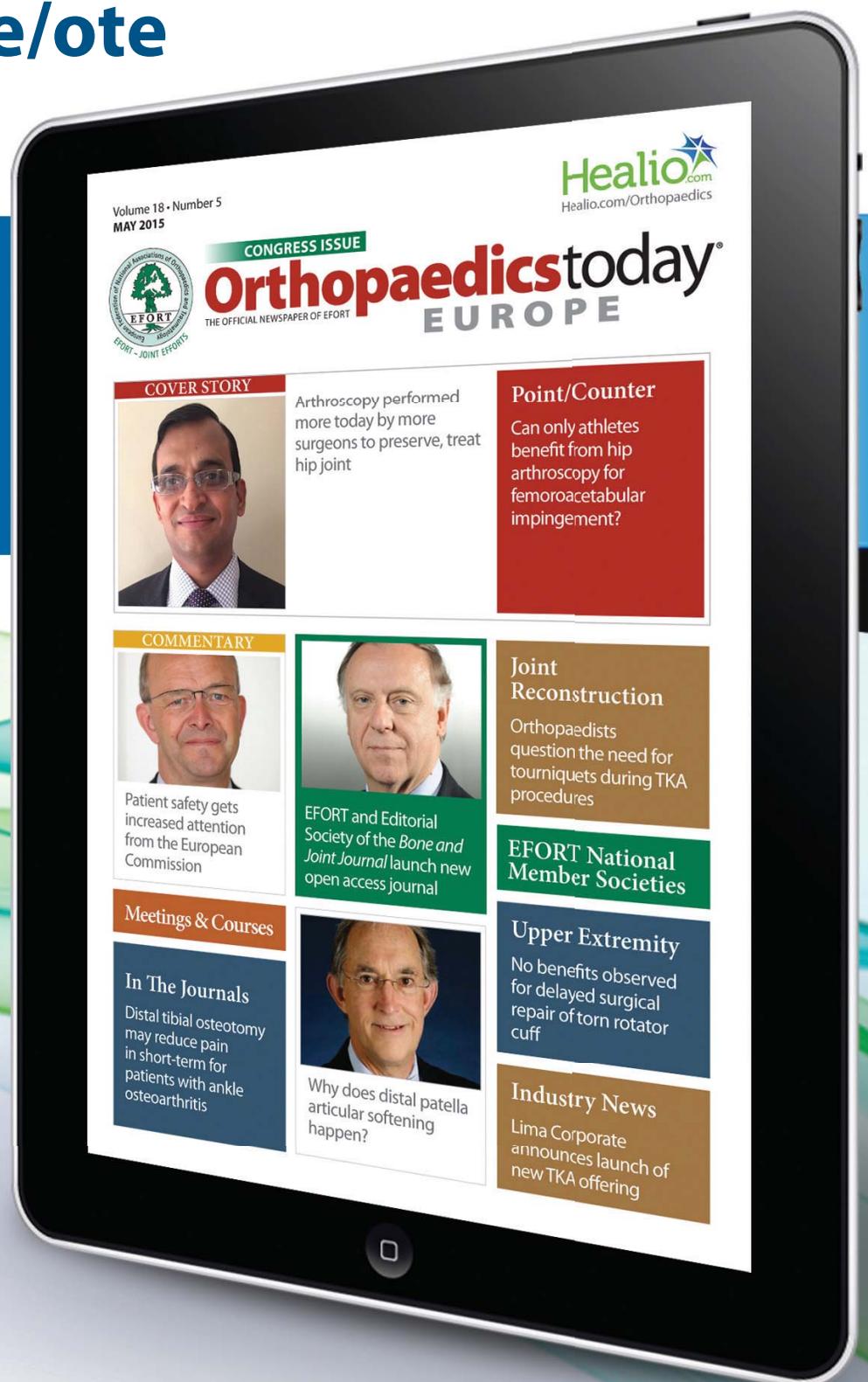


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#### Paediatric osteoarticular infections

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#### Visiting Fellowships, Mark Paterson Travelling Fellowship and Travelling Fellowship

EFORT offers three fellowships as an opportunity for young orthopaedic fellows to expand their horizons... page 5

#### Antibacterial hydrogel implant coating

Reduced infection rates seen in patients receiving antibacterial hydrogel coated implants... page 6

### ► Schedule of Events

- **Advanced Course in Total Hip Replacement**  
8.00-13.00  
Helsinki Room
- **Advanced Course in Total Knee Replacement**  
8.00-13.30  
Florence Room
- **Michael Freeman Honorary Lecture**  
12.30-13.00  
Prague Room

## Infection treatment option proves effective in joint reconstruction cases, dependent on aggressive debridement

There was 78% eradication of infection in total joint replacement procedures at 3 years follow-up with a simple protocol used by orthopaedic surgeons at the University of Oxford. These results were comparable to those with staged revision as an approach to infection treatment, according to data presented at the 16<sup>th</sup> EFORT Congress.



William Jackson

The protocol consists of debridement, antibiotics and implant retention (DAIR).

DAIR proved to be cost-effective and was associated with good functional outcomes in patients, William Jackson, BSc, MBBS FRCS(Orth), said.

### Comparable to other techniques

By comparison, washout results for peri-prosthetic infection range from 26% to 71% infection eradication. "It is only recommended in very acute infections," Jackson said.

Infection eradication rates for single- and two-stage revision are generally 80% to 90%, he said.

"Probably two-stage is still the gold standard, but there are encouraging results coming out with single-stage revision, particularly in certain situations," Jackson said.

However, he said patients are not functioning well following revision procedures. Data from the National Joint Registry of England, Wales and Northern Ireland showed Oxford Knee Scores were 24.9 points following one-stage revision and 22.8 points following two-

stage revision for infection, which indicates limited function.

### DAIR: A first option

"DAIR depends on your view of the implant and its viability," Jackson said.

It should be considered as a first option in patients with infected, but well-fixed total knee arthroplasty (TKA) implants, but he noted that expert debridement is essential.

"The rationale for this requires a very aggressive surgical debridement," Jackson said.

The procedure takes as long as a primary

joint replacement to complete, patients need 6 weeks of postoperative intravenous antibiotics, depending on the organisms grown from tissue cultures, and 1 year of oral antibiotic therapy.

The Oxford group takes a minimum of six intraoperative samples using separate instruments to prevent cross-contamination to determine the patient's infectious status after DAIR and whether the prosthesis can be retained.

### Results with acute infection

In a study conducted by Jackson and colleagues (*Jackson continued on page 7*)

## Orthopaedists face paradigm shift, new challenges in fight against infection

It is time for orthopaedic surgeons to rethink their approach to the diagnosis, treatment and management of orthopaedic infections, which are often associated with loose implants and other serious problems for patients, according to a presenter at the 16<sup>th</sup> EFORT Congress.

"The surgeon always must expect the unexpected," Heinz Winkler, MD, of Vienna, said.



Heinz Winkler

In today's environment, "we all know about the biofilm issue," he said, noting that orthopaedic surgeons must be familiar with biofilm therapy and equipped to address nearly any type of infection scenario that affects their patients.

During a session on musculoskeletal infections, Winkler, who is president of the European Bone and Joint Infection Society, said the biofilm concept is one that will guide the treatment of device-related orthopaedic infections in the future. But, he noted that when it comes to septic revision surgery, it is becoming increasingly important for the surgeon to equally consider the control of infection through surgery along with the patient's postoperative function when making clinical decisions.

(*Winkler continued on page 7*)

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EUROPE

## Speaker: Consider all information for diagnosis, treatment of paediatric osteoarticular infections

### Measurement of procalcitonin levels may equal C-reactive protein.

To fully understand the current scientific evidence in the diagnosis and treatment of paediatric osteoarticular infections, it is important to consider all opinions, published studies and randomised controlled trials, according to a presenter here at the 16<sup>th</sup> EFORT Congress.



Markus Pääkkönen

"I think that when we start evaluating evidence, it is not about throwing away everything, but just understanding where we are in space so you don't get lost," said Markus Pääkkönen, MD, of Turku University Hospital in Tampere, Finland.

Pääkkönen said the measurement of C-reactive protein is sensitive for the diagnosis of paediatric osteoarticular infections and sequential C-reactive protein (CRP) measurements are useful as markers in follow-up. Measurements of erythrocyte sedimentation rates (ESR) and CRP levels are also sensitive in the diagnosis of acute paediatric osteoarticular infections, he said. However, fast response to treatment makes for the best sensitivity when one combines CRP and ESR. Measurement of CRP levels is superior in monitoring and is more useful than ESR as a marker during follow-up, he said.

The measurement of procalcitonin levels for the diagnosis of paediatric osteoarticular infections may equal C-reactive protein, however, it is more expensive, Pääkkönen said. *Kingella kingae* may cause a weak inflammatory response and may not be as reliable as other causative agents. White blood cell count should not be used to rule out an osteoarticular infection, he said. During follow-up, CRP measurements react faster and are superior compared with ESR, he said.

Pääkkönen said short-term treatments have not yet been tested for MRSA, *Kingella* and *Salmonella* of osteoarticular infections in neonates or children with underlying diseases. He said first-generation cephalosporins and clindamycin are valid treatments for methicillin-sensitive *Staphylococcus aureus*, pneumococcal or streptococcal paediatric osteoarticular infections. Pääkkönen said 2 days to 4 days of intravenous treatment for a total of 3 weeks is sufficient in the treatment of osteomyelitis and 2 weeks of *Staphylococcus aureus*. Pääkkönen said a strong recommendation and a high level

of evidence exists for 3 weeks of antibiotic therapy in uncomplicated acute osteomyelitis and 2 weeks for septic arthritis. Individualised therapy is recommended for children who have MRSA, *Salmonella*, neonates and patients with immunodeficiency, he said.

The use of vancomycin in the treatment of paediatric osteoarticular infections

brings concerns about poor bone penetration, he said. There is also high recurrence rates when it is used as monotherapy. Additionally, limited data exist on combining vancomycin with other antibiotics in children, however, it is among a few choices for clindamycin-resistant MRSA.

#### Reference:

Pääkkönen M. Diagnosis and antibiotic therapy in acute paediatric osteoarticular

infections: What is the current scientific evidence? Presented 27 May at: The 16<sup>th</sup> EFORT Congress; 27-29 May 2015; Prague.

#### Source info:

Markus Pääkkönen, MD, is from the Department of Orthopaedics and Traumatology, Turku University, P.O. Box 52, Kinamylynkatu 4-8, Turku 20521, Finland; email: Markus.Paakkonen@helsinki.fi.

#### Disclosure:

Pääkkönen reports no relevant financial disclosures.

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## EFORT, WHO call for maintaining an active lifestyle later in life

In line with the efforts of the World Health Organization (WHO) to encourage remaining active and healthy later in life, the 17<sup>th</sup> EFORT Congress 2016 in Geneva will feature Maintaining Activity Through Life as the congress' main theme.



Pierre Hoffmeyer

This message, according to Pierre Hoffmeyer, MD, EFORT past-president and professor of orthopaedics and chief of the department of surgery at the University Hospitals of Geneva, is more critical today than it has ever been.

"The reality is the population is aging. We have more people over 65 years of age than under 20 years of age," Hoffmeyer said. "It is becoming not only a major social

problem, but also a major health problem."

For example, he said that roughly one in three women and one in seven men have osteoporosis. "And if a woman with osteoporosis falls and breaks her wrist, chances are in the next 2 or 3 years, she will break her hip as well," he said. "So EFORT is supporting prevention campaigns that encourage both activity and a good diet with vitamin D and calcium. We encourage exercising and keeping mobile, and then, if degeneration does occur, using prostheses to replace painful and nonfunctional joints. This helps to keep patients out of nursing homes and in the society, and saves everyone money."

This sentiment was echoed more than 15 years ago by WHO, an organisation with the mission of directing and coordinating international health within the United Nations' system. In 1999, WHO began the Active Ageing initiative as a way

to highlight the health benefits of being active later in life, emphasising the importance of social integration and health.

At the time, Gro Harlem Brundtland, MD, director general of WHO in 1999, was quoted as saying: "There is much the individual can do to remain active and healthy in later life. The right lifestyle, involvement in family and society, and a supportive environment for older age all preserve well-being. Policies that reduce social inequalities and poverty are essential to complement individual efforts towards active ageing."

Now, more than 15 years later, this message has once again come to the forefront. In addition to making the main theme of the 17<sup>th</sup> EFORT Congress in 2016 Maintaining Activity Through Life, the congress itself will provide an ideal venue for the communication of this vital message, according to Hoffmeyer.

"EFORT Congress is attended by 6.000

to 7.000 surgeons, a lot of whom will hear this message who may not have otherwise," he said. "So they will not only know these programmes exist, but will also have access to brochures, literature and information, which they can then share with their patients."

Hoffmeyer added that the other advantage to a congress like EFORT is the opportunity to share personal experiences with colleagues, so that the message and impact of these initiatives spread.

In the end, healthy ageing programmes and educational events like the EFORT Congress try to teach the importance of people "not only living an active and healthy life, but also showing that solutions are available if their joints become painful or their bones break," he said.

#### Disclosure:

Hoffmeyer reports no relevant financial disclosures.

## Ceramic-on-ceramic bilateral THA may result in fewer revisions than ceramic-on-poly hips

There is a significant difference between the survivorship and number of revisions needed in bilateral total hip arthroplasty according to the type of material used when the procedure is performed with a different type of articulation in each hip, according to results of a study in which some patients were followed up for 30 years.

Philippe Hernigou, MD, professor of orthopaedic surgery at CHU Henri Mondor, in Créteil, France, presented the study results at the 16<sup>th</sup> EFORT Congress.

He and colleagues compared the revision rates, survivorship, outcomes and complications for alumina ceramic-on-ceramic (AL) cups and polyethylene (PE) cups used on 32-mm ceramic femoral heads during total hip arthroplasty (THA) performed on both hips in the same patient. The anodized titanium alloy stem used in each case had a smooth surface and was cemented, and all implants were produced by the same manufacturer, according to Hernigou.

The 60 patients studied were younger than 30 years old at the time they underwent bilateral THA and they all had a diagnosis of osteonecrosis.

### Better ceramic-on-ceramic performance

Hernigou and colleagues found the AL cups implanted in procedures performed between 1978 and 1985 outperformed the PE cups in nearly every category.

"Considering the endpoint at 30 years, the survival of ceramic-on-ceramic hips was 75% without revision and 95% with-



Philippe Hernigou

out two revisions. The survival with PE cups was 58% without revision and 70% without two revisions. Hips with PE bearing surfaces were approximately six times more likely to undergo

two subsequent revisions before 30-years follow-up as compared with AL hips," Hernigou told *EFORT Congress Daily News*.

The study Hernigou and colleagues conducted is among the top papers presented at the EFORT Congress.

### Revisions analysed

At the 30-year follow up, 15 hips of the 60 AL hips required revision and three hips underwent a re-revision, according to Hernigou. For the PE cups implanted in the patients' contralateral hips, 25 PE hips required one revision, 18 PE hips required one re-revision, and four PE hips underwent subsequent revision of a re-revision.

In addition, none of the AL hips developed osteolysis, but over the 30-year study period several PE hips developed osteolysis.

"With 30 years of follow-up, this series confirmed there is no osteolysis with AL/AL hips contrary to hips with PE friction where osteolysis increased with time. The poorer outcomes after revision surgery for patients with PE cups as compared with revision after ceramic hips revision could

be explained by the more technically demanding procedure with osteolysis, the additional loss of bone stock and failures of allografts," Hernigou said.

### Complications with PE cups

The PE cups showed a higher dislocation rate than the AL cups, which was due to bone osteolysis and fatty muscle degeneration, according to Hernigou.

Hernigou and colleagues found CT scans could demonstrate reduced density in the muscles in the hip and this corresponded to fatty muscle degeneration, which in turn was associated with an increased incidence of osteolysis. The researchers could then use these factors to

predict the patients' risk of postoperative dislocation.

"Muscle fatty degeneration was more important on the PE side and associated with a higher rate of late dislocations on the PE side," Hernigou said.

#### Reference:

Hernigou P. Paper #1085. Presented on 28 May at: The 16<sup>th</sup> EFORT Congress; 27-29 May 2015; Prague.

#### Source info:

Philippe Hernigou, MD, can be reached at 51 Avenue du Maréchal de Latte de Tassigny, 94010 Créteil, France; email: philippe.hernigou@wanadoo.fr.

#### Disclosure:

Hernigou reports no relevant financial disclosures.

### PERSPECTIVE

Ceramic-on-ceramic (CoC) vs ceramic on polyethylene: what is best? In the study by Philippe Hernigou and colleagues, the results after 30 years confirmed the advantage of CoC. This has already been documented in different studies. The first one, by Zichner and Willert, compared metal-on-poly and ceramic-on-poly. From hip simulator studies, debris generation appeared lower for ceramic-on-poly by a factor of 2. If now compared to CoC, the advantage of the latter decreased by a factor of 2.000. But, the most interesting aspect relates to the difference in biological reaction: CoC developed a very strong fibrous tissue that might explain a lower dislocation rate and better ability for sports. Even polyethylene, improved by highly crosslinking, still will produce millions of small debris with a potential macrophage reaction. Biological reaction will be different. It will not develop a strong fibrous membrane and there is still some risk of breakage in the long-term.

Then CoC, with excellent materials and good design, remains the most promising material for very long-term results in patients who want to continue physical activities and weight bearing.

Laurent Sedel, MD

Hopital Lariboisiere, University Denis Diderot, Paris

Disclosure: Sedel reports he is a consultant for Ceraver Company.

References: Sedel L. Alumina on polyethylene bearings.

In: Learmonth ID, ed. *Interfaces in Total Hip Arthroplasty*.

1st ed. Springer Verlag London; 2000:135-141.

Zichner L, et al. *Clin Orthop Relat Res*. 1992;282:86-94.

## EFORT Expands Fellows' Horizons with Series of Travelling Fellowships

Each year EFORT awards several orthopaedic trainees with a series of fellowships designed to enhance and unify their training, continuous medical education and knowledge transfer, all while helping them create new personal bonds to improve the collaboration and unity within all national associations of orthopaedics and traumatology in Europe.

EFORT currently offers three fellowships.

### Visiting Fellowship

EFORT's Visiting Fellowships are offered yearly to fellows from Europe, with some also open to applicants from the Middle East and Africa. The Visiting Fellowship grant allows fellows to visit a host institution for an extended period of time and provides finances to cover travel and living expenses.

While visiting the host institution, fellows are exposed to new techniques in practical orthopaedics including trauma and orthopaedic/trauma science and pathophysiology.

The visiting fellow also gives a presentation or lecture about his or her own clinical or experimental research to colleagues at the host institution to facilitate a real exchange of knowledge and information between both parties.

More specific information about the different visiting fellowships is mentioned in the detailed announcements on [www.efort.org/foundation](http://www.efort.org/foundation).

### Travelling Fellowship

The EFORT Travelling Fellowships are another opportunity designed to expand the horizons of young orthopaedic fellows. Each year, EFORT member association presidents are asked to nominate a fellow with high potential in their final year of training in traumatology or orthopaedics. Selected fellows will receive a grant that allows them to travel to a host country for one



**Philippe Neyret**

week to visit centers of excellence and observe and participate in the work and research that occurs there.

"These fellows are considered as the 'cream' of their generation and most of them will

represent the future of European orthopaedic surgery," said Philippe Neyret, MD, PhD, of the Centre Albert Trillât, Hôpital de la Croix-Rousse, and chairman of the Travelling Fellowships.

Host countries organise clinical sessions and operative demonstrations, lectures, and social meetings for the group of fellows, while selected fellows are required to give a presentation about themselves, their country and their national association, as well as their experi-

ences and expectations of the fellowship program.

In late April, three fellows completed the EFORT 2015 Spring Travelling Fellowship in Croatia, travelling to Dubrovnik, Osijek, and Zagreb.

### Mark Paterson Travelling Fellowship

Started in 2013, the Mark Paterson Travelling Fellowship allows three orthopaedic surgeons to spend two weeks visiting centres of excellence in main-

land Europe or the United Kingdom. Each year, the selected senior trainees or newly qualified consultants pack their bags and embark on a series of visits designed to expand their horizons and develop their medical skills, culminating with attendance at either the EFORT Congress or British Orthopaedic Association Congress.

The location of the fellowship alternates between the United Kingdom and mainland Europe. In 2015, three United Kingdom-based surgeons were selected to visit three European centres: James

Barnes, Sujith Konan and George Grammatopoulos. Each fellow is expected to prepare three short presentations of original work to present at the centres visited. After the fellowship is completed, the fellows collaborate to prepare an account of their trip to be published by *The Bone & Joint Journal*.

Interested parties can find out more about applying for the fellowship by visiting the *The Bone & Joint Journal* website or the EFORT website 8 to 9 months prior to the fellowship.



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## Active, healthy ageing a shared mission of EFORT, EU

In 2016, the main theme of the 17th EFORT Congress in Geneva will be Maintaining Activity Through Life, a message at the heart of a flagship initiative of the European Commission.

The initiative, called the "European Innovation Partnership on Active and Healthy Ageing," aims to find innovative solutions that meet the needs of the ageing population, with the overarching objective of increasing the average healthy lifespan by 2 years by 2020, according to **Karl-Göran Thorngren, MD, PhD**, co-opted EFORT member, past-president and chairman of the EFORT Foundation.



**Karl-Göran Thorngren**

"The partnership gathers key stakeholders – end users, public authorities, industry – and all actors in the innovation cycle, from research to adoption, along with those engaged in standardisation and regulation, and offers a framework for co-

operation to address barriers hindering innovation," said Thorngren, who is also professor of orthopaedic surgery at Lund University Hospital in Sweden. "All involved partners have agreed to three priority areas for action: prevention, screening and early diagnosis; care and cure; and active ageing and independent living."

Although the European Commission led the initiative, EFORT was involved in the initial discussions on its creation and contributed to the drafting of the European Innovation Partnership Strategic Implementation Plan.

"EFORT was also an official partner and supporter of the European Year 2012 for Active Ageing and Solidarity between Generations," Thorngren said.

This partnership with the European Union continued in the oncoming years, including EFORT's role in the ProFouND project aimed at influencing policy and increasing awareness of falls and innovative prevention programs among all sectors and organisations that work with older people, and culminated with the 2016 congress theme.

For Thorngren, it is critical for the 17th EFORT Congress 2016 to bring attention to the importance of maintaining an active and healthy lifestyle, because the number of Europeans older than 65 years of age is expected to double in the next 50 years, and the number over the age of 80 will almost triple.

"Along with this, musculoskeletal conditions are set to become an even bigger problem. This has huge ramifications on both the ability of elderly people to remain independent, and, of course, on public health spending," he said. "All these patients will require surgery and hospital care. [Orthopaedic and traumatology] surgeons have an essential role to play in preserving or restoring the mobility of people."

Part of the reason surgeons will play such a vital role, Thorngren said, is that with increasing age, fractures in the elderly, too, will rise, as will balance problems causing falls and bone loss due to osteoporosis.

"Many elderly [people] suffer from a sequence of different fractures during

their remaining life span," he said. "When the orthopaedic surgeon is treating the fractures, there is a golden opportunity to start prevention of possible future fractures. The patient is highly motivated to receive information and start muscle and balance training, which together with improved nutrition, also counteracts sarcopenia, which is a main aspect of frailty. These factors are, of course, also important to prevent eventual fractures around hip and knee arthroplasties."

The 17th EFORT Congress in 2016 will directly address this major societal challenge and provide an ideal opportunity for attendees to share personal experiences with colleagues and spread the word.

"The increased awareness and interest to start actions within the orthopaedic and traumatology community will give a great and highly important impact on the health status of the elderly, promoting active ageing," Thorngren said.

#### Disclosure:

Thorngren reports no relevant financial disclosures.

## Antibacterial hydrogel implant coating may be safe for wrist, ankle osteosynthesis

The defensive antibacterial coating (DAC) hydrogel product (Novagenit; Trento, Italy) studied was effectively reduced infection rates in patients receiving the implants after their procedures, **Nicola Logoluso, MD**, told *EFORT Congress Daily News*.



**Nicola Logoluso**

The study is among the best papers selected to be presented at 16th EFORT Congress.

"Clinical application of the DAC hy-

drogel coating ranges from cementless joint prostheses to internal osteosynthesis. Our data show that, on average, wound healing, clinical scores, laboratory tests and radiographic findings did not show any significant difference between DAC-treated vs control, while two



**Sara Scarponi**

patients in the control group developed a surgical site infection within 90 days from surgery compared to none in the treated group," Logoluso said.

### DAC may reduce infection

The prospective, randomised controlled study included 70 patients who underwent internal osteosynthesis for closed wrist or ankle fractures. Patients were randomised to either a surgical group receiving a DAC implant or a group that received a typical uncoated implant. Patients underwent preoperative and postoperative assessments of laboratory tests, SF-12 clinical scores and wound healing scores. In addition, radiographs were taken throughout the study so those outcomes could also be compared.

At 6 months mean follow-up, there was no clinically significant difference between the groups for laboratory tests or the SF-12 and wound healing scores. There were no surgical site infections for patients with the DAC-coated implant, but two patients in the control group developed infections, according to Logoluso.

### Additional testing needed

Sara Scarponi, MD, another investigator, told *EFORT Congress Daily News* additional studies are needed to confirm the efficacy of the coating in a clinical setting to see if it effectively prevents implant-related infection. This concept

was previously successfully tested in animal models.

"Although these are preliminary data, this study shows a novel, fast-resorbable antibacterial hydrogel coating can be safely used in patients undergoing internal osteosynthesis for closed fractures and cementless joint prosthesis without local or systemic side effects and no radiological signs of interference with bone healing," Scarponi said.

#### Reference:

Scarponi S. Paper #3233. Presented on 27 May at: The 16th EFORT Congress; 27-29 May 2015; Prague.

#### Source info:

**Nicola Logoluso, MD**, and **Sara Scarponi, MD**, can be reached at Dipartimento di Chirurgia Ricostruttiva e delle Infezioni Osteoarticolari, Istituto Ortopedico I.R.C.C.S. Galeazzi, Via Riccardo Galeazzi, 4, 20161 Milan, Italy; Logoluso's email: nicola.logoluso@gmail.com; Scarponi's email: scarponi1981@libero.it.

#### Disclosures:

Logoluso and Scarponi report the project was funded by a grant from the European Community, "Implant Disposable Antibacterial Coating (I.D.A.C.): A Novel Approach to Implant-Related Infections," 7th Framework Programme on Research Technological Development and Demonstration, grant no. 277988.

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# 17<sup>th</sup> EFORT Congress heads to Geneva

Join us for the 17<sup>th</sup> EFORT Congress, a combined congress in partnership with Swiss orthopaedics sessions, 1-3 June 2016 in Geneva, Switzerland. Abstract submission and registration open 15 September 2015 and closes 15 November 2015. The main theme of the 17<sup>th</sup> EFORT Congress is Maintaining Activity Through Life. Access congress details as they develop at [www.efort.org/geneva2016](http://www.efort.org/geneva2016)

*(Winkler, continued from page 1)*

Winkler recommended following the five basic requirements of revision for eliminating biofilm-associated infection. These requirements involve taking steps to localise, reduce and disrupt the infection, to fill any resultant defects, and to eliminate sessile bacteria within the defects using high concentrations of antibiotics in the most consistent way possible.

Localising infection equates with identifying the infection and keeping it contained, he said.

"If you find them, then you have to reduce them. It is unavoidable doing some surgery and you should reduce the number by removing all identified bad material as radically as possible," according to Winkler.

Furthermore, surgery disrupts the communication of the biofilm.

Debridement is another effective method that Winkler discussed, which he said both reduces and disrupts septic infection.

"You can evidently disrupt the biofilm by mechanical debridement and you also open a window of opportunity where the biofilm's bacteria are more susceptible. With this debridement, and with the conventional antibiotics, we can remove the predominant amount of the bacterial load... We also can easily eliminate planktonic bacteria and we can disrupt the biofilm communication, but we cannot remove the microscopic remnants after the debridement," he said.

"Once you have debrided the site, you should fill it. Dead space management is a very important part of septic surgery," Winkler said.

He discussed some of the evidence

against performing multi-stage revisions for infection and why he supports one-stage revisions. Because it is difficult, at best, to fully remove microscopic biofilm remnants with today's surgical approaches, Winkler recommended that surgeons "aim at the minimum number of operations."

One-stage procedures destroy the least amount of tissue and will ultimately provide patients with a better quality of life. This is because one-stage procedures are associated with shorter hospital stays and they improve the patient's overall condition and reduce the infection burden should a two-stage revision ever be required, according to Winkler.

He noted that remnants of infection missed during debridement require high concentrations of antibiotics to disrupt them, which may be as much as 400 to 500 times the usual concentration of antibiotics.

**Reference:**

Winkler H. Changing paradigms in diagnosis and treatment of orthopaedic infections. Presented 27 May at: The 16<sup>th</sup> EFORT Congress; 27-29 May 2015; Prague.

**Source info:**

Heinz Winkler, MD, is a consultant orthopaedic surgeon and director of the Osteitis Center at Privatklinik Döbling. He can be reached at Heiligenstädter Straße 46-48, A-1190 Vienna, Austria; email: [h-winkler@aon.at](mailto:h-winkler@aon.at).

**Disclosure:**

Winkler reports no relevant financial disclosures.

*(Jackson, continued from page 1)*

of 120 cases of total joint infections, most of which were primary arthroplasties of the hip and knee, the length of time an implant was in place and the presence of *Staphylococcus aureus* were important to the results with the DAIR technique.

"We see there was a trend for getting better results with early implants and the acute infections seem to do better than ones that had an implant in for over 90 days," he said.

Jackson said they found *S. aureus* cases and revision arthroplasty that later became infected tended to do worse after DAIR treatment.

**Reference:**

Jackson W. Oxford experience of de-

bridement, antibiotics and implant retention (DAIR) in prosthetic knee infections. Presented 28 May: The 16<sup>th</sup> EFORT Congress; 27-29 May 2015; Prague.

**Source info:**

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**Disclosure:**

Jackson reports he is a paid consultant to and speaker for Biomet; a paid speaker to DePuy, a Johnson & Johnson Company; a paid speaker for and has stock with Smith & Nephew; and a paid speaker for Stryker.

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