Content:

Introduction
Abstracts Bone Regeneration
Abstracts Cartilage Regeneration
AMIC® Registry
Geistlich Chondro-Gide® wins Innovation-Prize
Conferences & Events in 2007
Links
Who’s who in Geistlich Orthopaedics


Geistlich Biomaterials leading regeneration
Introduction

Biomaterials in Trauma and Orthopaedic surgery are becoming increasingly popular, and as we begin to realise the limitations of our current metal-based treatment methods, the trend for more natural biological solutions will grow.

A biomaterial is defined as any substance, natural or synthetic, used as part of a system to augment or replace any tissue, organ or function in the body.

Orthopaedic surgery is at the forefront of this movement, with applications in joint reconstruction, trauma fracture fixation, soft tissue fixation, spinal fusion, and cartilage regeneration.

Joint Replacement
Orthopaedic procedures for the replacement of joints, such as the hips and knees, are well established and highly effective. In arthroplasty, particularly revision surgery, the bone defect the surgeon is faced with often requires the use of a Bone Substitute (e.g. Orthoss®) as an alternative or in addition to autograft or allograft bone.

Fracture Repair
In the repair of bone fractures, metal plates, screws, nails, and wires are used to stabilize the fracture until union occurs. In such cases, bone grafts can be used to bridge the fracture and promote bone formation and healing.

Spinal Fusion
Spinal fusion represents the largest indication for bone substitute material as the vast majority of these procedures require extra bone to ensure union of the fusion site.

In spinal fusion, bone grafts may be used alone or with metal implants to achieve fusion of the vertebrae. Although allograft and autograft currently dominate the market, bone substitute materials such as Orthoss overcome the disadvantages associated with autograft, such as pain as well as the risk of rejection or viral transmission with allograft.

Cartilage Regeneration
When cartilage is damaged, it is generally held that the long term risk of developing osteoarthritis is greatly increased. New tissue engineering methods offer restoration of the affected site by replacing functional cartilage tissue. There are three proven methods by which tissue engineering can repair damaged articular cartilage: osteochondral autografts, microfracture in combination with a collagen matrix (AMIC®) and autologous chondrocyte implantation.

Geistlich Biomaterials has recognized these trends and responded to them by becoming a specialist in biomedicine (regenerative medicine). We are currently the worldwide market leader in regenerative dentistry and more than 2 Million patients have been treated with Geistlich products over the last 20 years. Our Orthopaedic products include biological matrices for the regeneration of bone and cartilage. They reliably provide a scaffold function so new tissue can effectively grow into the defect and regenerate body structures – for today and for the future.

Geistlich Biomaterials
November 2006
Abstracts Bone Regeneration

ESSKA 2000, Innsbruck
Bovine bone substitutes in revision knee arthroplasty – early results

Lakdawala A., El-Zebdeh M., Gadel Rab R., Ireland J.
Holly House Hospital, Essex, United Kingdom, Newham General Hospital, London, United Kingdom

Introduction: Failure of total knee replacement (TKR) due to wear related osteolysis is often associated with significant bone destruction. Restoration of bone stock is important but reconstruction of large defects can be challenging. Bone grafts ± augments (modular prosthesis) are usually used. Bovine bone substitutes have been used successfully in acetabular reconstruction [1] but their use in revision knee arthroplasty has not been reported. Early clinical results of using bovine bone substitutes in revision knee surgery are presented.

Materials and methods: Between April 2001 and March 2004, bovine bone was used in 19 consecutive revision arthroplasty cases. The study was approved by the local ethics committee and all patients received full information. Patients who objected to have bovine bone grafts were excluded. Data was recorded prospectively. There were 11 males and 8 females. The average age was 70.4 years. All revisions were carried out for aseptic loosening. The bone defects in the tibia and femur were classified according to Anderson Orthopaedic Research Institute classification (AORI) intra-operatively:

<table>
<thead>
<tr>
<th>Type</th>
<th>Tibia</th>
<th>Femur</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE 1</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>TYPE 2A</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>TYPE 2B</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>TYPE 3</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Tibial defects were reconstructed by impaction grafting and femoral condylar defects by bulk grafts. Semi-constrained stemmed cemented modular knee prostheses (TC3, Depuy) were used in all. The mean follow-up at review was 2.6 years. All patients were assessed by an independent reviewer using the Oxford knee score to assess functional outcome. Serial radiographs were evaluated to look for graft integration. Ewald’s method was used to determine the orientation of femoral and tibial components.

Results: Good bone integration with host bone was observed in all patients. The tibial and femoral components were well aligned (mean coronal alignment angle = 7.2°). There were no progressive radiolucent lines at the graft-host bone interface or subsidence of the tibial implants. The average Oxford knee score was 20.4. There was 1 early failure that had persistent knee pain. Surgical exploration at 6 months of that knee showed good graft integration and no loosening of prosthesis.

Conclusion & Discussion: Bone defects were successfully reconstructed with bovine bone substitute. We believe it is an alternative to autograft and allograft bone. It has an osteo-conductive matrix with intact type-I collagen that provides mechanical stability. Early results are encouraging but long-term follow-up is needed.


Comments: With the implementation of the Human Tissue Bill, fewer hospitals will be able to continue to operate a bone bank. Our bone graft demands will continue to increase and as banked allograft becomes more expensive and difficult to procure we need to find other sources of safe, biocompatible, stable bone. Bovine deproteinised bone (Orthoss®) has both the physical and biochemical properties that most closely match human bone. Geistlich has over 20 years experience in both the Orthopaedic and Dental fields with Orthoss® Bone substitute.
Bone has the ability to regenerate and remodel. In clinical practise it occurs that bone defects may not heal spontaneously. These situations frequently result from trauma, congenital abnormities, infection or tumour resection. Hence, filling of the resulting defect by bone transplantation is a common practise in trauma and orthopaedic surgery to assist bone healing. Initial approaches with the use of ivory, animal and also human bone were ineffective. Complications such as allergic reactions, rejection reactions, inflammation and other problems occurred. These led to implant failure, non union and amputation, to only mention a few. Towards the middle of the last century, the introduction of bone banks and the development of standards in bone transplantation brought about false hopes of finding a final solution for the treatment of bone loss in orthopaedic surgery. Problems associated with disease transmission, for example the human immunodeficiency virus (HIV) or the hepatitis virus by allografts have caused critical discussions.

Another idea to improve bone healing is the use of osteoinductive substances such as BMP and others. In principle, different bone substitutes are available: they are autologous bone, allogenic frozen bone graft conserved in bone banks, and synthetic bone substitutes.

Bone augmentation plays an increasingly important role in regenerative surgery of the musculoskeletal system. It is used plastic surgery, maxillo-facial surgery, neurosurgery, orthopaedic surgery and especially in trauma and reconstructive surgery. For decades, efforts have been made to improve the effectiveness of bone substitutes, but the clinical results of these procedures have never been very satisfactory. Despite all the efforts, transplantation of autologous cancellous bone is still the “gold standard” to promote bone healing. Unfortunately autologous cancellous bone is limited in its availability and its harvest is accompanied by high morbidity and mortality. Therefore, allogenic bone is preferred for many occasions in clinical application.

In light of the problems associated with autologous and allogenic bone grafts, the development of multiple organic and inorganic bone substitutes has been promoted. Well established bone substitutes at present include demineralised bone matrix (DBM), composites and calcium phosphates (hydroxyl apatite’s and tri-calcium phosphates). These osteoconductive substances have been shown to improve new bone formation during intensive experimental and clinical investigations. Nevertheless, clinical application of these osteoconductive materials is only successful in a good bony environment but does not induce large progress in critical bone defects.

The concept to promote bone healing today is the combination of osteoconductive, osteoinductive and osteogenic substances, in a biocompatible, bioresorbable, and cost effective bone graft substitute.
Hip revision with bone grafting using inorganic bone mineral matrix

Wagner M
Bethanien Orthopaedic Clinic, Chemnitz, Germany

The new European Transplantation Regulation makes it very difficult, or even impossible, to run a bone bank from 2007 onwards. In most revision procedures a reconstruction of bone defects is mandatory. Femoral heads harvested from sound donors during total joint replacement have been used worldwide for decades. Since this well-established procedure may be no longer applicable in the future other proven materials are necessary to fill bone defects.

From February to July 2006, at the Orthopaedic and Trauma Department, in Chemnitz, a series of 15 acetabular revisions with major bone defects was conducted, using inorganic bone mineral matrix of bovine origin (Orthoss, Geistlich Biomaterials). This mineralised bone matrix is chemically comparable with mineralised human bone. Many earlier animal experimental studies had proved the excellent osteoconductivity.

The average age of the surgical patients was 75 (56 – 84 years). No additional bone grafts were used, no structural allografts were necessary to reconstruct the bone defects in the pelvis. The defects were filled with bone matrix; antiprotrusio cages and acetabular reconstruction rings were used as acetabular prosthetic components.

The postoperative course was uneventful in all 15 cases. No revision was necessary, no infection occurred. In the short-term follow-up, the clinical and radiological examinations showed no changes; there was no resorption of the commercially available bone graft. No implant migration could be detected.

The inorganic bone mineral matrix, of bovine origin, seems to be a good substitute for human bone in total hip revision surgery. It is suitable to fill even major defects, but it is no substitute for structural allografts. The short-term results, in mainly cavitary defects, are promising; the use of this material does not need any difficult preparation because it can be stored on the shelf without needing refrigeration.

Comments: As the population ages, so we are beginning to see more and more patients outliving their primary joint replacement and requiring a revision. With each subsequent revision the amount of native bone stock left to work with decreases and the need for replacement bone increases. Orthoss is ideally placed with excellent osteoconductive properties and an architecture which most closely matches that of human bone. This provides an excellent scaffold for the ingrowth of new bone and blood vessels and due to its natural origins, Orthoss is also able to actively take part in the bone remodelling process without the generation of ‘by products’ which will need to be broken down and excreted by the body.
Abstracts Cartilage Regeneration

BOA-Congress 2006, Glasgow

Autologous OsPlug – Autologous Chondrocyte Implantation (AOsP-ACI): a novel surgical technique for treating large osteochondral defects in synovial joints

Robert Jones and Agnes Hunt Hospital, Oswestry, United Kingdom

Introduction: A new surgical hybrid technique involving the combination of autologous bone plug(s) and autologous chondrocyte implantation (AOsP-ACI) was used and evaluated as a treatment option in 15 patients for repair of large osteochondral defects in knee (N=12) and hip joints (N=3).

Materials & Methods: Autologous Osplugs were used to contour the articular surface and the autologous chondrocytes were injected underneath a biological membrane (Chondro-Gide, Geistlich) covering the plug. The average size of the osteochondral defects treated was 4.5 cm². The average depth of the bone defect was 26mm.

Results: The patients had a significant improvement in their clinical symptoms at 12 months with significant increase in the Lysholm Score and Harris Hip Score (p = 0.031). The repaired tissue was evaluated using magnetic resonance imaging, computerised tomography, arthroscopy, histology and immunohistochemistry (for expression of type I and II collagen). Magnetic Resonance Imaging, Computerised Tomography and histology at 12 months revealed that the bone plug became well integrated with the host bone and repair cartilage. Arthroscopic examination at 12 months revealed good lateral integration of the AOsP-ACI with the surrounding cartilage. Immunohistochemistry revealed mixed fibro-hyaline cartilage.

Conclusion: We conclude that the hybrid AOsP-ACI technique provides a promising surgical approach for the treatment of patients with large osteochondral defects. This study highlights the use of this procedure in two different weight bearing joints and demonstrates good early results which are encouraging. The long term results need to be evaluated.

Comments: Despite the loss in popularity of Osteochondral plug transfer procedures for chondral defects, this group has found a use for it in addressing the bony component of deep osteochondral defects while using an ACI procedure for the cartilage component. It is important to note that this technique is still only useful for relatively small defects as the same criticisms about donor site availability apply. Any larger lesions may be better treated using a mixture of autologous and ‘synthetic’ (Orthoss®) bone graft. Having said that, this procedure has shown very promising results and biologically makes use of the best components of both OATS and ACI.
Autologous Matrix-Induced Chondrogenesis (AMIC®) for focal cartilage defects of the knee – First Clinical and MRI Results

Anders S1, Wiech O1, Schaumburger J1, Behrens P2, Grifka J1
1Orthopädische Klinik der Universität Regensburg, Asklepios Klinikum, Bad Abbach, Germany.
2Universitätsklinikum Schleswig-Holstein, Klinik für Orthopädie, Campus Lübeck, Germany

Introduction: Bone marrow stimulating techniques such as microfracture are frequently used to treat focal chondral defects of the knee. These techniques release Mesenchymal Stem Cells (MSC's) from the bone marrow cell pool to participate in the regeneration. One of the limiting factors of this technique is the defect size, which if over 2 cm² runs the risk of premature degeneration. The AMIC technique combines microfracture with the application of a collagen matrix to cover the defect and provide mechanical stabilisation of the MSC ‘super-clot’

Method: 26 Patients (6 Women, 20 Men, Age 18-52 years, mean age 38, 7 years) with 28 focal partial or full-thickness chondral defects (ICRS III-IV) of the medial condyle (20), Lateral Condyle (4), Trochlea (3) and the Patella (1) were treated with standard microfracture and application of a collagen I/III Matrix (Chondro-Gide®, Geistlich Biomaterials). Patients were prospectively followed clinically and using MRI. The mean defect size was 3.45 cm² (1 – 5.9 cm²). 6 Patients had OCD defects which were treated with autologous bone grafting. 4 Cases underwent simultaneous ACL reconstruction.

Results: The minimum follow-up period was 6 months with 15 patients having more than 1 year follow-up. Pre-operatively all patients rated their knee as abnormal (57,7%) or severely abnormal (42,3%), while post-operatively 78,2% of patients rated their knee as normal or nearly normal. The mean modified Cincinnati score improved from 53,4 to 79,8 points, while the subjective pain rating using a VAS dropped from 6,0 to 2,0 and function improved from 4,3 to 7,6. These score improvements were significant. The MRI assessment demonstrated good defect filling without any signs of an effusion.

Conclusion: Microfracture in combination with a collagen I/III matrix (AMIC®) is a very attractive minimally invasive treatment method for medium to large focal chondral defects. The first experiences with AMIC demonstrate clinical improvement, pain reduction and a subjective improvement, making this an extremely promising therapy.

Comments: Despite still being a relatively new procedure, the AMIC® technique continues to show great promise. It borrows from both microfracture and ACI, using the best of both worlds. From microfracture it makes use of MSC's to enable a single stage repair, while the use of a Chondro-Gide® membrane borrowed from ACI provides the mechanical and biological protection to the friable “super-clot”, enabling the cells to attach to the sub-chondral bone and begin differentiating into chondrocytes which will form a healthy repair.

Translated by: Dr. Sven Kili, Senior Medical Advisor, Geistlich Biomaterials
A prospective 3 year study of Autologous Chondrocyte Transplantation using a Collagen membrane in the knee.

Kreuz PC, Steinwachs M, Krause S, Lahm A, Uhl M, Südkamp N
1Department Orthopädie und Traumatologie, Universitätsklinik Freiburg, Freiburg, Germany, 2Abteilung Radiologie, Universitätsklinik Freiburg, Freiburg, Germany

Introduction: Autologous Chondrocyte Implantation (ACI) has established itself as an effective treatment for large grade 3 and 4 chondral defects of the knee. Despite the success described with the use of a periosteal cover, there are numerous complications including periosteal cover delamination and periosteal hypertrophy. This prospective study sets out to describe the pros and cons of the ACI technique using a Collagen membrane (Chondro-Gide®).

Materials & Methods: Between 2000 and 2002, 63 patients (31 • and 32 •) with an isolated chondral defect of the knee were treated with ACI using a collagen I/III membrane (Chondro-Gide®, Geistlich). Exclusion criteria included Meniscal damage, Varus or Valgus deformity and an age over 50 years. Included patients all had isolated chondral defects over 2cm², graded as III and IV according to the ICRS classification. Post-operative follow-up of all patients was carried out at 6, 18 and 36 months. Follow-up visits included MRI scans and clinical examinations with ICRS and Modified-Cincinnati scores. Statistical analysis was performed using a non-parametric Wilcoxon test.

Results: The mean patient age was 34 years (range 18 – 50) and the mean defect size was 5,85cm² (range 3-16cm²). 34 Defects were located on the femoral condyles, 19 retro-patellar and 10 on the trochlea. Pre-operatively all patients were rated as "poor" or "fair" on the Cincinnati score and "abnormal" or "severely abnormal" on the ICRS classification. Post-operatively both the ICRS and modified Cincinnati scores showed a statistical improvement at all time points up to 36 months (p<0,01). Additionally there were no significant differences between the defect locations (p<0, 2). The Pearson correlation co-efficient between the ICRS and modified-Cincinnati scores at all 3 time intervals was 0,6. No cases of graft hypertrophy were recorded.

Conclusion: Autologous Chondrocyte Implantation provides a good quality clinical result for chondral defects of the knee. The post-operative rehabilitation phase does however require time and significant improvements are still seen between 18 and 36 months post-op. No chondral repair will ever work unless the biomechanics and alignment of the leg and knee are corrected. Compared to the modified-Cincinnati score, the ICRS score is a more specific and critical assessment of cartilage repair techniques. The recognised problem of periosteal hypertrophy was most probably not seen here due to the Chondro-Gide® membrane being used instead of a periosteal patch which contains a cambium layer.

Comments: Since its first clinical use in Sweden, ACI has rapidly become the gold standard for treating chondral lesions larger than 2cm². Despite the excellent outcomes from this technique it has always been haunted by the need for a larger/ second incision to harvest periosteum and the increased incidence of periosteal hypertrophy necessitating further surgery and further delaying the rehab progress. This study demonstrates that the use of Chondro-Gide® enables the surgeon to side-step both problems without compromising the outcome of the surgery or the patient's safety.

Translated by: Dr. Sven Kili, Senior Medical Advisor, Geistlich Biomaterials
The past ten years have generated much research and technical innovation in the field of cartilage repair. The common aim of all methods is to produce a stable, quality cartilage repair or regenerate. Unfortunately, clinical, radiological and histological results analysing the different techniques are somewhat contradictory. The various lines of research have focused on:
1. Techniques to generate the mobilisation of progenitor and mesenchymal stem cells from the cancellous bone into the defect to develop a hyaline-like cartilage.
2. Transplantation of osteochondral auto-grafts (Mosaicplasty, OATS, SDS) or allograft.
3. Autologous chondrocyte Implantation and periosteal coverage (ACI) for larger defects has been followed by 2nd and 3rd generation ex vivo products. (Chondrocytes cultured on membranes, gels, 3-D de novo cartilage disk or even engineered osteochondral grafts)

Much of today's research is focusing on the culture of a patient's own chondrocytes or his own stem cells. Clinically, some methods may be applied in all indications regardless of size, localisation, depth up to the age of 50 and this is valid for lesions in the knee, shoulder, talus, elbow etc. Other methods like OATS should not be used for lesions over 2 cm in diameter due to donor side morbidity. All methods claim an 85% outcome success rate. Microfracture produces a fibrocartilage repair which looks similar to the hyaline-like cartilage of ACI at two years. Mosaicplasty plugs remain hyaline, provided they are inserted without being prone or deep sunken and the surface convexity of the femoral condyle is restored and provided they are inserted tightly next to each other. There is agreement that this is more difficult arthroscopically. Results are dependent on the alignment of the limb and if the compartment treated is overloaded, there is less chance of integration. The ability to perform an osteotomy is therefore a requirement for the cartilage surgeon- up to 50% of our cases receive an osteotomy as part of their treatment regardless of which technique is utilised.

Complications in mosaicplasty include: hyaline cartilage cap damage, non integration and pseudarthrosis or fractures of the cylinders (of special risk are smokers), especially when grafts are not inserted tightly to each other with fluid leakage from the cartilage caps. Rarely ossification is observed. Donor site morbidity is an issue of concern especially if more than six plugs are removed from the patellofemoral joint. This alone can create clinical symptoms. Nicotine abuse decreases the rate of success of cartilage repair and osteotomy healing. Roughly 300 cases have been treated during the last 10 years. The results were reported in 2002. As an alternative single surgery technique, we adopted the "Autologous Matrix induced Chondrogenesis" (AMIC) technique proposed by Behrens. We find this especially useful in OCD. In this relatively young technique, we curette the defect and microfracture the base of the osseous defect. Cancellous bone is then harvested from the tibial plateau and mixed with fibrin glue, of which 50% of the thrombin portion is replaced by the serum of the patient as a source of growth factors. This paste of bone and enriched fibrin glue fills the defect which is then covered by the Chondro-Gide® membrane (Geistlich). This is glued on or may be sutured to the defect. The AMIC technique may also be used to treat pure cartilage defects. After two months PWB we observe good osseous integration of the graft and a covering layer that looks promising. After 4-6 months, activity may be increased depending on the size of the defect. This is a young technique that we adopted in mid 2003 with 30 cases treated so far, therefore strict observation is required over the upcoming years regarding clinical results and durability as well the composition of this neocartilage. So far it seems to be an interesting alternative to Mosaicplasty since it combines principles of cell therapy with a natural and instant biological containment that acts against the loss of cells acting as an internal bioreactor with the patients own growth factor support.
AMIC Registry

AMIC® (Autologous Matrix Induced Chondrogenesis) is a new biological cartilage repair method. It was first introduced by Prof. P. Behrens in 2003 with the aim of using stem cells to harness the body’s own regenerative capacity. The AMIC® technique is based on proven biological concepts first demonstrated by Dr Richard Steadman using the microfracture method. AMIC® with the collagen matrix Chondro-Gide is an enhanced, matrix supported microfracture technique for the treatment of larger cartilage defects. Since the beginning, several hundred AMIC® procedures have been carried out.

In order to provide clinical information about the AMIC® Method, Geistlich has set up an online registry to enable surgeons to enter the data about their patients directly at www.geistlich-registry.com.

The registry is intended to serve as a post marketing surveillance database in order to collect AMIC treatment associated parameters as well as short and long term results.

The AMIC registry is based on two clinical outcome measures, the validated Lysholm score and the VAS pain scale. MRI evaluation is also included in order to monitor the healing response of the defects.

In exchange for your assistance in completing the registry, an online analysis and export feature for Excel are provided to allow you to monitor your patients progress.

Additionally, you will receive regular updates about AMIC performance/results and news.

For more information and access please contact:

Adrian Schnyder
Clinical Research Associate Orthopaedics
Mail: schynder@geistlich.ch
Phone: +41 41 492 67 04
**Geistlich Chondro-Gide® wins Innovation-Prize**

Press release from the Geistlich company dated 3 October 2006

With regard to the Chamber of Commerce of Central Switzerland Innovation prize 2006

The Geistlich company has been awarded the Chamber of Commerce of Central Switzerland Innovation prize for the second time now – this time for its innovative product, Chondro-Gide®, which enables the regeneration of cartilage after serious cartilage injuries.

“This recent award makes us feel very pleased and proud”, says Michael Peetz, Managing Director of Geistlich Biomaterials, the biotechnology branch of Geistlich Pharma AG. “We are convinced that we will also be very successful on the market with our new product, Chondro-Gide®.”

The Geistlich company was awarded the Chamber of Commerce of Central Switzerland Innovation prize in 1994 for its bone grafting material, Bio-Oss®. As a result of this, Geistlich advanced to the top global position in regenerative dentistry. This product is now used successfully in over 50 countries on all continents.

The Chamber of Commerce’s 2006 award for the collagen matrix Chondro-Gide® may be just the start of a similar success story. Together with international experts in the fields of orthopaedics and sports medicine, Geistlich has developed the Chondro-Gide Matrix which is used in different surgical methods with the aim to regenerate cartilage. This process can initiate and accelerate healing after serious cartilage injuries. It can reduce the need for artificial knee joints, or at least delay the use of such joints by several years.

On November 27, the Chamber of Commerce of Central Switzerland will award the Geistlich company its prize at an official ceremony. “We are looking forward to this event” says Michael Peetz of Geistlich Biomaterials. “It will enable us to prove our innovation potential again.”

The clinical introduction and success of Chondro-Gide® is very much driven by four leading surgeons in Cartilage Regeneration:

- **Dr. Sven Anders**, Bad Abbach, Regensburg, Germany
- **Prof. Dr. P. Behrens**, Hamburg, Germany
- **Prof. Dr. R.P. Jakob**, Fribourg, Switzerland
- **Prof. hc. (RCH) PD Dr. med. M. Steinwachs**, Freiburg, Germany
### Congresses and Events 2007

<table>
<thead>
<tr>
<th>Congress</th>
<th>Date</th>
<th>Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geistlich Symposium &quot;Update Knorpelregeneration&quot;</td>
<td>February 2</td>
<td>Fribourg, Switzerland</td>
</tr>
<tr>
<td>AAOS</td>
<td>February 14.-18.</td>
<td>San Diego</td>
</tr>
<tr>
<td>SIA</td>
<td>March 7.-11.</td>
<td>Modena, Italy</td>
</tr>
<tr>
<td>Süddeutscher Orthopäden-Kongress</td>
<td>April 26.-29.</td>
<td>Baden-Baden, Germany</td>
</tr>
<tr>
<td>EFORT Congress</td>
<td>May 11.-15.</td>
<td>Florence Italy</td>
</tr>
<tr>
<td>2007 Biennial ISAKOS Congress</td>
<td>May 27.-31.</td>
<td>Florence Italy</td>
</tr>
<tr>
<td>Norddeutscher Orthopäden-Kongress</td>
<td>June 14.-16.</td>
<td>Hamburg, Germany</td>
</tr>
<tr>
<td>ICRS Meeting Rehabilitation</td>
<td>June 29.-30.</td>
<td>Zurich, Switzerland</td>
</tr>
<tr>
<td>ICRS Surgical Skills Course</td>
<td>Sept. 27.28.</td>
<td>Warsaw, Poland</td>
</tr>
<tr>
<td>ICRS Meeting 2007</td>
<td>September 29-Oct. 2.</td>
<td>Warsaw, Poland</td>
</tr>
<tr>
<td>15th Triennial Congress of the Asia Pacific Orthopaedic Association</td>
<td>September 9.-13.</td>
<td>COEX Seoul Korea</td>
</tr>
<tr>
<td>SGO</td>
<td>September 19.-21.</td>
<td>Montreux</td>
</tr>
<tr>
<td>BOA</td>
<td>September 25.-28.</td>
<td>Manchester, UK</td>
</tr>
<tr>
<td>AGA</td>
<td>September 27.-29.</td>
<td>Köln</td>
</tr>
<tr>
<td>DGU/DGOOC</td>
<td>October 24.-27</td>
<td>Berlin, Germany</td>
</tr>
</tbody>
</table>

At the 2006 national German Congress for Orthopedics and Traumatology, Geistlich hosted two Lunch Symposia, one about Cartilage Regeneration and the other about Bone Regeneration.

*Prof. P. Behrens talked about Chondro-Gide® and AMIC® Method*

*PD Dr. M. Wagner, Prof. R. Neugebauer and Prof. W. Schlickewei presented their clinical experience with Orthoss®*
Leading Regeneration in Bone and Cartilage Repair

Chondro-Gide® Cartilage Regeneration

Chondro-Gide® is a ready-to-use matrix for different Cartilage Repair Methods

ACT (Autologous Chondrocyte Transplantation)
Chondro-Gide® eliminates the retrieval process of periosteum, adheres the autologous cultured cells and reduces the risk of hypertrophy.

AMIC (Autologous Matrix Induced Chondrogenesis)
Chondro-Gide® provides a matrix to form new cartilage, protects and stabilizes the blood clot and prevents bleeding into the joint.

Orthoss® Bone Regeneration

Bone Regeneration with Orthoss® means:
- Rapid revitalization through new blood vessel formation
- Osseointegration through high porosity with interconnected pores
- Integration and support for the natural remodelling process

Kontakt:
Geistlich Pharma AG
Division Biomaterials
Bahnhofstr. 40
CH-6110 Wollhusen
Tel. +41-41-49 25-630
Fax +41-41-49 25-639
wwwgeistlich.com
Who’s who in Geistlich in Orthopaedics?

Switzerland:
Dr. Michael Peetz, Managing Director Geistlich Biomaterials
Dr. Katja Martin, Manager Clinical Research
Hans Rudolf Saegesser, M.Sc., Director Sales and Marketing
Dr. J.F. Clémence, Director Clinical Research
Adrian Schnyder, M.Sc. Clinical Research Associate

Germany:
Dr. Emil Endress, Dr. Jürgen Gallas, Kenneth Kropp

Italy:
Salvo Martelliano, Margherita Costa

UK:
Mr. (Dr.) Sven Kili, Senior Medical Advisor- Orthopaedics
Your Geistlich Partners

Geistlich Subsidiaries:

Distribution Germany:
Geistlich Biomaterials
Vertriebsgesellschaft mbH
Schneidweg 5
D-76534 Baden-Baden
Phone: +49/(0)7223 96 24 -0
Fax: +49/(0)7223 96 24 10
www.geistlich.de

Distribution Italy:
Geistlich Biomaterials Italia S.r.l
Via A. Fogazzaro 13
I-36016 Thiene VI
Phone: +39/0445-370 890
Fax +39/0445-370 433
www.geistlich.it

Distribution UK:
Geistlich Biomaterials
Geistlich Sons Limited
Long Lane
Chester CH2 2 PF
Phone: +44 1244 347 534
Fax: +44 1244 319 327
www.geistlich.co.uk
orthopaedics@geistlich.co.uk

Your local Geistlich Distributor:

Manufacturer and Distribution in Switzerland:
Geistlich Pharma AG
Biomaterials Division
Bahnhofstrasse 40
CH-6110 Wolhusen/Switzerland
Phone: +41 41 492 56 30
Fax: +41 41 492 56 39
www.geistlich.com
info@geistlich.ch