

# BRUSSELS HAND/UPPER LIMB INTERNATIONAL SYMPOSIUM

Genval

Brussels, Belgium

January 27-28, 2012

20<sup>th</sup> year

ULB



**ADVANCES IN PROSTHETICS AND  
SURGICAL RECONSTRUCTIONS  
FOR HAND/UPPER EXTREMITY  
AMPUTEES**



**Final  
Program**

[www.brusselshandsymposium.eu](http://www.brusselshandsymposium.eu)

## AIMS AND FORMAT

Already twenty years! The first annual Brussels/Genval Upper Limb Symposium, held in May 1992, was on Advances in Hand and Wrist Biomechanics. Since this first meeting, the Château du Lac at Genval has hosted, each spring or beginning of the year, the Brussels Hand/Upper Limb Symposium, dedicated to a specific interdisciplinary topic involving the hand and the upper limb. Each meeting has been attended by 80-150 participants from 15-25 different countries. One of these symposia (in 2007) was on composite tissue allotransplantation. We discussed on that occasion, the current and future indications of vascularized (for example, hand transplantation) and non-vascularized (bone, tendon and nerve) allografts, including basic research on immune regulation and ethical issues. Indeed, many progresses have been made these last five years in the field of vascularized tissue allotransplantation, including in better understanding rejection phenomena and decreasing the immunosuppressive regimen; successful upper-elbow transplantation has now been achieved; the majority of hand-transplanted patients have regained good function and some sensibility, and consider their daily life as almost completely restored to normal. These successes give much hope to amputees, whether congenital, posttraumatic (and unfortunately the number of such patients tends to increase due to the world wars), or because of other causes.

But, most amputees will never benefit from a transplantation. Many advances have been made in other aspects of treatment of these patients, these include restoring, by surgical means, an acceptable stump and/or reconstructing a functional pinch, for example by stump lengthening, or partial or total toe transfer. Progresses have also been made in controlling phantom pains. However, it is in prosthetics that the novelties are the most spectacular. Bone-anchoring may avoid the usual socket problems, and advances in osteointegration open new perspectives in prosthetics, whether cosmetic or functional. New lightweight, yet quite complex, myoelectric prostheses are developed, even allowing independent finger motion. With these advances in mechatronics, the major problem becomes the control of the prosthesis by the patient, including of position and especially force applied by each finger. New dedicated computing technologies will allow machine learning of specific tasks, based on relatively simple electromyographic signals. Another concept is to have the prosthesis self-adapting to the object shape, by means of sensors. But the problem of the available myoelectric signals remains crucial. One can increase the number of signals by selective muscle neurotizations, and as an added effect this procedure seems to provide to the amputee some proprioceptive sensibility. Very soon, one can expect that the myoelectric prostheses will become brain-controlled, which needs precise understanding of the central movement execution pattern and special implantable electrodes: progresses are now made in the understanding of the local field potentials in the brain cortex. Another major limitation of course remains the training of the amputee him/herself. Progresses have been made in postoperative physiotherapy, and in the evaluation of the functional results, including of regained dexterity. The causes of abandoning of the prosthesis by the amputee, which remains frequent at mid term including in bilateral amputations, will as well be the matter of discussions. Specific problems concern congenital amputations; the tendency is presently relatively early prosthetic fitting, like at the lower extremity. Finally, we should remember that the majority of upper extremity amputations affect patients living in developing countries, who cannot afford neither expensive myoelectric prostheses nor transplantation under immunosuppression. Progresses in low-cost conventional "body-powered" prostheses will also be discussed during the symposium.

The primary goals of the Brussels/Genval annual upper limb Symposium – 20<sup>th</sup>-anniversary session in 2012, gathering together in a first-class resort close to Brussels, are to promote the exchange of ideas, to establish guidelines on a consensual basis, and to foster collaborative investigations among various specialists; experts from different fields (the previous Symposia have been attended by orthopaedic, plastic, paediatric and general surgeons, anatomists, physiotherapists, rheumatologists, anaesthesiologists, pain specialists, radiologists, nuclear medicine scientists, immunologists, pathologists, engineers and basic scientists) will exchange their experiences. Much time will be set aside for the discussions.

### SPECIFIC AIMS

- To summarize the current progresses in stump and pinch reconstruction after congenital or traumatic finger/hand/upper extremity amputation, including by partial or total hand/upper arm transplantation; to

evaluate new prosthetic concepts, including comfort and cosmetic aspects, adapted physiotherapy and evaluation of the results ;

- To discuss basic research, and new developments in immune regulation towards hand transplantation, in neurosciences as applied to amputees, and in prosthetics ;
- To assess the innovative prosthetic techniques from the patient's perspectives, and to compare these innovations to conventional devices and to the perspectives of upper extremity transplantation ;
- To formulate, on these bases, recommendations to the medical community;
- To discuss unsolved problems and possible solutions;
- To explore future directions of research.

# FINAL PROGRAM

## THURSDAY, JANUARY 26, 2012

16.00 - 18.00 Registration

## FRIDAY, JANUARY 27, 2012

07.30 – 17.00 Registration

### 08.00 - 10.05 SESSION 1: AN INTRODUCTION TO THE SYMPOSIUM (1)

Moderators : O. Aszmann, J. Bahm

- 08.00 **Opening Address**  
F. Schuind (Brussels, Belgium)
- 08.05 **Multi-Finger Synergies during Isometric Force Production Task in Index Finger Amputees**  
S. Karol, J.K. Shim (College Park Washington, MD, USA, and Yongin-si, Korea)
- 08.25 **Focus of Phantom-Limb Pain**  
Ph. Voordecker (Brussels, Belgium)
- 08.45 **Salvage of the Hand following Hot Roller – Deglovement Injury : Functional Satus of the “Mitten” Hand**  
W.M.F. Vanhove, S. Vertriest, S. Geers, N. Hollevoet (Gent, Belgium)
- 09.05 **Grip (Pinch) Reconstruction after Wrist and Distal Forearm Amputation**  
S.K. Vilkki (Tampere, Finland)
- 09.25 **Hand Transplantation, State of the Art**  
S. Schneeberger (Innsbruck, Austria)
- 09.35 **Challenges in Composite Tissue Allotransplantation**  
S. Schneeberger (Innsbruck, Austria)
- 09.45 **Discussion**
- 10.05 Coffee-break and Visit of the Commercial Exhibition

### 10.35 - 12.15 SESSION 2: AN INTRODUCTION TO THE SYMPOSIUM (2)

Moderators: W. Hülsemann, C. Van Holder

- 11.35 **Osseointegration in Rehabilitation of Arm and Finger Amputees**  
R. Brånemark (Göteborg, Sweden)
- 11.55 **Revolutionizing Prosthetics**  
M. McLoughlin, A. Ravitz, J. Vogelstein (Baltimore, MD, USA)
- 11.15 **Bionic Reconstruction of the Upper Extremity**  
O. Aszmann (Vienna, Austria)

11.35 **Cost-Risk-Benefit Analysis of Myoelectric Prosthesis compared to Forearm Transplantation in Unilateral and Bilateral Amputees**  
E. Vögelin (Bern, Switzerland)

11.55 **Upper Extremity Braces, Current Status and Future Research and Development**  
E.Y.S. Chao (Rochester, MN, USA)

12.15 **Discussion**

12.35 Lunch and Visit of the Commercial Exhibition

### 14.00 - 15.30 **SESSION 3: NORMAL HAND FUNCTION AND EVALUATION**

Moderators: K; Cermak, (Chao E.Y.S)

14.00 **Tactile Detection of Slip. Fine Characterization of Skin Deformation during the Onset of Slip**  
B. Delhay, P. Lefèvre, J.-L. Thonnard (Brussels, Belgium)

14.15 Discussion

14.20 **Effect of Digital Anesthesia on Multi-Finger Synergies during a Sub-Maximal Constant Force Production Task**  
S. Karol, Y.S. Kim, J. Huang, B.C. Yoon, Y.S. Kim, H.Y. Pyeon, Y.H. Kim, J.K. Shim (College Park Washington, MD, USA and Yongin-si, Korea)

14.30 Discussion

14.35 **Grip Force Control Strategies during Slow Load Variations**  
T. Giard, J.-L. Thonnard, P. Lefèvre (Brussels, Belgium)

14.45 Discussion

14.50 **Evaluation and Management of Neuropathic Pain**  
D. Mouraux, Ch. Robert, E. Brassinne, P. Signorino (Brussels, Belgium)

15.05 **3D Virtual Reality applied to Mirror Visual Feedback Therapy**  
B. Penelle, D. Mouraux, E. Brassinne, A. Nonclercq, N. Warzeé (Brussels, Belgium)

15.15 Discussion

15.20 **Upper Extremity Kinematic Evaluation**  
P. Salvia, M. Van Vooren, J. Coupier, O. Snoeck, V. Sholukha, F. Moisee, S. Van Sint Jan, V. Feipel, M. Rooze (Brussels, Belgium)

15.35 Discussion

15.40 Coffee-break and Visit of the Commercial Exhibition

### 16.10 - 17.35 **SESSION 4: CONGENITAL DIFFERENCES**

Moderators : J. Pillet, O. Barbier

16.10 **Technique of Pollicization**  
O. Barbier (Brussels, Belgium)

16.25 **Results of Pollicization**  
L. De Smet (Leuven, Belgium)

- 16.40 Discussion
- 16.45 **Toe Transfers in the Rehabilitation of the Congenitally Adactylic Hand**  
S.K. Vilkki (Tampere, Finland)
- 16.55 **Pinch Reconstruction by Double Toe Transfer in Congenital Adactylic Hands**  
W. Hülsemann, R. Habenicht (Hamburg, Germany)
- 17.05 Discussion
- 17.10 **Reconstruction of Basic Hand Function in Total Obstetric Brachial Plexus Palsy**  
J. Bahm, W. El Kazzi (Brussels, Belgium and Aachen, Germany)
- 17.30 Discussion

**17.35 - 18.00 SESSION 5: UPPER EXTREMITY AMPUTATIONS, GENERAL ISSUES, CONGENITAL DIFFERENCES – ROUND TABLE AND CASE PRESENTATIONS**

Moderators : M. McLoughlin, L. De Smet

**18.30 – 23.00 Social Program : optional**

## **SATURDAY, JANUARY 28, 2012**

**08.00 - 11.10 SESSION 6: POST-TRAUMATIC SURGICAL RESTORATION OF HAND FUNCTION (1)**

Moderators : E. Vögelin, R. van Riet

- 08.00 **Epidemiology of Traumatic Hand Amputations**  
A. Aly, K. Cermak, J. Bahm, F. Schuind (Brussels, Belgium)
- 08.10 Discussion
- 08.15 **Finger and Hand Amputations, MedicoLegal Issues**  
Y. Andrienne (Brussels, Belgium)
- 08.30 **Upper Extremity Translocation, Case Report**  
A. Carlier (Brussels, Belgium)
- 08.40 Discussion
- 08.45 **Virtual Reconstruction Planning and Cutting Guides in a Case of Elbow Reconstruction**  
X. Libouton, L. Paul, O. Barbier (Brussels, Belgium)
- 09.00 **Post-Traumatic Elbow Stiffness**  
R. van Riet et al (Deurne, Brussels, Belgium)
- 09.15 **Total Elbow Arthroplasty for Post-Traumatic Deformities of the Elbow**  
I.F. Kodde, D. Eygendaal (Breda, The Netherlands)

- 09.25 Discussion
- 09.35 **Results of Krukenberg Operation**  
L. De Smet (Leuven, Belgium)
- 09.45 Discussion
- 09.50 **Reconstruction of the Radio-Ulnar Frame**  
I. Degreeef (Leuven, Belgium)
- 10.05 Discussion
- 10.15 **Corrective Distal Radius Osteotomy. Does Two-Dimensional Planning Result in Accurate Three-Dimensional Positioning ? A Retrospective Study**  
J.C. Vroemen, J.G.G. Dobbe, S.D. Strackee, G.J. Streekstra (Amsterdam, The Netherlands)
- 10.20 **Computer-Assisted 3-D Planning, Realization and Evaluation of a Single-Cut Rotational Osteotomy for Complex Long-Bone Deformities**  
J.G.G. Dobbe, K.J. du Pré, P. Kloen, L. Blankevoort, G.J. Streekstra (Amsterdam, The Netherlands)
- 10.30 Discussion
- 10.40 **Reconstruction of the Distal Radio-Ulnar Joint with a Prosthesis of the Distal Ulna in the Treatment of a Recurrent Giant Cell Tumour**  
A. Zyluk, D. Kotrych, I. Walaszek (Szczecin, Poland)
- 10.50 Discussion
- 10.55 **Amputations in Dupuytren's Disease**  
I. Degreeef (Leuven, Belgium)
- 11.05 Discussion
- 11.10 Coffee-break and Visit of the Commercial Exhibition

## **11.40 - 12.25 SESSION 6: POST-TRAUMATIC SURGICAL RESTORATION OF HAND FUNCTION (2)**

Moderators : S.K. Vilkki, A. Carlier

- 11.40 **Toe Transfer, a Very Useful Tool in Post-Traumatic Hand Reconstruction**  
S.K. Vilkki (Tampere, Finland)
- 11.50 **Long-Term Result of a Second Toe Transfer on a Forearm Stump (Vilkki's Operation) in a Hand Amputee**  
J. Kaczmarzyk, L. Kaczmarzyk, A. Domanasiewicz, J. Jablecki (Trzebnica, Poland)
- 12.00 **Limits of Indications of the Morrison Wrap Around Procedure in Thumb Reconstruction**  
W.M.F. Vanhove, J. Devos, N. Hollevoet, R. Verdonk (Gent, Belgium)
- 12.10 Discussion
- 12.25 Lunch and Visit of the Commercial Exhibition

### 13.30 - 14.35 SESSION 7: PROSTHETICS FOR PARTIAL HAND AMPUTATIONS

Moderators : R. Brånemark, D. Mouraux

- 13.30 **Surgical Considerations and Prosthetics Options for the Partial Hand Amputee. An Integrated Approach between Surgeon, Patient and Prosthetist**  
B.T. Carlsen, P.C. Prigge (Rochester, Maple Grove, MN, USA)
- 13.40 **Aesthetics and Function after Cosmetic Protheses**  
J. Pillet (Paris, France)
- 13.55 Discussion
- 14.05 **Innovations in Prosthetic Management after Partial Amputations and Congenital Malformations of the Hand**  
M. Schäfer, Traunstein, Germany
- 14.15 Discussion
- 14.20 **Congenital Partial Hand Absence: What is the Impact of Fitting with an Electric Multi-Articulating Digit Protheses?**  
D.J. Atkins (Houston, Texas, USA)
- 14.30 Discussion

### 14.35 – 16.10 SESSION 8: PROSTHETICS FOR HAND AMPUTATIONS

Moderators : O. Aszmann, I. Degreef

- 14.35 **A Single Centre Experience with Multi Articulating Hand Prosthesis**  
L. Shortt (Livingston Scotland, U.K.)
- 14.50 **Discussion**
- 14.55 **OsseoIntegration : Biological Considerations**  
R. Brånemark (Göteborg, Sweden)
- 15.05 **Skeletal Fixation of ExoProsthesis by Osseo-Integrated Implant in Upper Limb Amputees. First Experience with a New Technique. Research Setup**  
W.M.F. Vanhove, S. Vertriest, R. Verdonk, G. Vanderstraeten (Gent, Belgium)
- 15.15 Discussion
- 15.25 **MultiFunctional Myoelectric Hand Systems in the Prosthetic Management of the Upper Limb. Demands and Limiting Factors**  
M. Schäfer, Traunstein, Germany
- 15.35 Discussion
- 15.40 **Selective Nerve Transfers to Improve the Control of MyoElectrical Arm Protheses**  
O. Aszmann (Vienna, Austria)



- 15.50 Discussion
- 15.55 **Brain-Controlled MyoElectric Prostheses**  
B. Armiger, M. Johannes, C. Moran, M. McLoughlin, A. Ravitz, J. Vogelstein (Baltimore, MD, USA)
- 16.05 Discussion
- 16.10 Coffee-break and Visit of the Commercial Exhibition

**16.30 - 17.35 SESSION 9: HAND TRANSPLANTATION**

Moderators : M. McLoughlin, W. Vanhove

- 16.30 **Indications and Contra-Indications of Hand Transplantation in 2012**  
F. Schuind (Brussels, Belgium)
- 16.45 Discussion
- 16.50 **Donor and Recipient Considerations in Upper Extremity AlloTransplantation**  
R. Wollstein, V.S. Gorantla, J.E. Losee (Pittsburgh, PA, USA)
- 17.00 **Composite Tissue Preservation by Extra-Corporeal Blood Perfusion and Vascular CytoProtection for Time Limit Expansion in Transplantation**  
E. Vögelin, M.A. Constantinescu, R. Rieben (Bern, Switzerland)
- 17.10 Discussion
- 17.20 **Cryopreservation for the Reconstruction by Transplantation of Limited Hand Defects**  
C. Zirak (Brussels, Belgium)
- 17.30 Discussion

**17.35 - 18.20 SESSION 10: ADVANCES IN PROSTHETICS AND SURGICAL RECONSTRUCTIONS FOR HAND/UPPER EXTREMITY AMPUTEES**

Moderators : F. Schuind, J. Bahm

- 17.35 **Face to Face debate: CrossFire, Unilateral Forearm Transplantation, Prosthesis or Transplantation ?**  
O. Aszmann (Vienna, Austria), F. Schuind (Brussels, Belgium)
- 17.55 **Ten Questions to the Floor and the Faculty – Case Presentations**
- 18.10 **Summary and Conclusions**  
F. Schuind, J. Bahm, K. Cermak, R. van Riet (Brussels, Belgium)
- 18.20 End of Symposium

# SYMPOSIUM INFORMATION

<http://www.brusselshandsymposium.eu>

## SYMPOSIUM VENUE

Château du Lac,  
Avenue du Lac 87  
1332 Genval  
Belgium

## REGISTRATION FEES

Registration On-line at: <http://www.brusselshandsymposium.eu>

### After 1 November

Regular Delegate (1)	500
Resident/Student (2)	350
Physiotherapist/Nurse	350
<i>Optional: touristic visit and banquet (27 January 2012) (3)</i>	100

### 1 day registration

Regular Delegate	250
Resident/Student */Physiotherapist/Nurse	175

- (1) Fees include meeting attendance, congress bag with the abstract book and all related documents (certificates of payment and attendance, badge etc.), and lunches. Not included: hotel accommodation, meals except 2 lunches. Acknowledgement of registration and receipt of fees will be sent soon after the registration form and full payment are received. Upon request, a letter of invitation will be sent. Payments should be made free of all bank charges and commissions.

The organizers cannot be held responsible for any personal injury, loss, damage, accident to private property, or additional expenses incurred as a result of delays or changes in air, rail, sea, road or other services, strikes, sickness, weather, war, sports and other causes. Luggage is at owners risk throughout unless insured.

- (2) Please include a certificate signed by head of department.  
(3) Included: coach transport Genval-restaurant, touristic visit, and dinner in a typical Belgian restaurant.

### CANCELLATION

In the event of cancellation, a full refund (less € 100 as a handling fee) of the registration fees may be obtained, provided that written notification is received by December 15, 2011. A 50 % refund will be made for cancellations received by January 15, 2012. No refunds will be made thereafter.

## ACCOMMODATION

### *Château du Lac (5 stars hotel) (Venue)*

15 km south of Brussels. An invigorating and sophisticated ambience, exquisite décor, fine cuisine. Free access available at the 'John Harris Fitness Centre' for participants accommodated at the Château.

#### Address:

Château du Lac, avenue du Lac, 87, B-1332 Genval, Belgium  
Tel.: + 32 2 655 71 11 – Fax + 32 2 655 74 44 - E-mail: [seminars.cdl@martinshotels.com](mailto:seminars.cdl@martinshotels.com)

Participants can also be accommodated at the hotel "**Le Lido**"; a 3 stars hotel located about 2 km from the Château du Lac (no transport will be provided).

#### Address:

Le Lido, 20, rue de Limalsart, B-1332 Rixensart, Belgium  
Tel.: + 32 2 634 34 34 - Fax +32 2 634 34 44 - E-mail: [lelido@martinshotels.com](mailto:lelido@martinshotels.com)

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