Preliminary Program

NATO
Advanced Research Workshop

Advances in the Biomechanics of the Hand and Wrist

Genval
Brussels, Belgium
May 22-23, 1992

SECRETARIAT
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Tel. 32/2/555 36 91 - Fax 32/2/520 35 56
AIMS

The main objective of this workshop is to promote the interchange of ideas and collaborative investigation among clinicians and basic scientists. The specific aims are:

(1) to summarize current scientific knowledge in the area of hand and wrist biomechanics,

(2) to identify related clinical problems and potential solutions based on current scientific knowledge,

(3) to establish the direction for future investigation.

ORGANIZING COMMITTEE

F. SCHUIND (Belgium)  W.P. COONEY (USA)
M. GARCIA-ELIAS (Spain)  K.N. AN (USA)

FACULTY

A.A. AMIS (UK)  R.A. BERGER (USA)
T. BRYANT (Canada)  F. BURNY (Belgium)
F. CASOLO (Italy)  S. FIORETTI (Italy)
L. HAGBERG (Sweden)  R. HUISKES (Netherlands)
C. JANTEA (Germany)  J.M.G. KAUSER (Netherlands)
J. KOEBKE (Germany)  R.L. LINSCHEID (USA)
A.K. PALMER (USA)  J. RYU (USA)
P. SAFFAR (France)  P. SOUCACOS (Greece)
G. VANDERPERRE (Belgium)  S.F. VIEGAS (USA)
F. WERNER (USA)

Daily Program at a Glance

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<td>(Saturday)</td>
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<tr>
<td>08.00</td>
<td>Material properties (lectures - room A)</td>
<td>Motion analysis (lectures - room A)</td>
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<tr>
<td>09.20</td>
<td>Coffee break</td>
<td>Coffee break</td>
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<tr>
<td>09.40</td>
<td>Material properties: Tendons (room A) Ligaments (room B)</td>
<td>Motion analysis: Hand (room A) Wrist (room B)</td>
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<tr>
<td>10.55</td>
<td>Panel discussion (room A)</td>
<td>Panel discussion (room A)</td>
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<td>12.00</td>
<td>Lunch</td>
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<td>14.00</td>
<td>Force analysis (lectures - room A)</td>
<td>Clinical applications (lectures - room A)</td>
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<td>15.20</td>
<td>Coffee-break</td>
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<td>15.40</td>
<td>Force analysis: Hand (room A) Wrist (room B)</td>
<td>Clinical applications: Hand (room A) Wrist (room B)</td>
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<td>16.30</td>
<td>Opening ceremony: support to research (NATO, Europe, USA)</td>
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<tr>
<td>17.10</td>
<td>Panel discussion (room A)</td>
<td>Conclusions (room A)</td>
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<td>17.25</td>
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<tr>
<td>18.00</td>
<td>Welcome reception</td>
<td>Dinner in central Brussels</td>
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<td>19.30</td>
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Program

Thursday, May 21
10.30 - 18.00 Registration
16.30 - 18.30 Opening Ceremony
   (Moderator : K.N. An.)
   Opening address - F. Schuind
   The NATO policy on research funding -
   L. Sertorio.
   The European Community and scientific
   funding - J.G. Wurm.
   The situation of grants in the USA -
   W.P. Cooney.
18.30 - 19.30 Welcome reception
19.30 - 21.00 Dinner

Friday, May 22
08.00 - 09.20 Material properties - lectures
   (Moderators : K.N. An, W.P. Cooney)
   The structure and function of ligaments and
   tendons - K.N. An.
   Mechanical properties of finger flexor tendons,
   and development of suturing methods with
   enhanced strength - A. Amis.
   Tendon excursion, rehabilitation and repair -
   W.P. Cooney.
   Subchondral bone density as a key for normal
   and pathological wrist stress - J. Koebke.
09.20 - 09.40 Coffee-break.
09.40 - 10.55 Material properties : ligaments
   (Moderator : R.A. Berger)
   The study of the behaviour of the larger
   wrist joint ligaments should include
   all fibre-bundles - J.G.M. Kooloo, H.H.C.M.
   Savelberg.
   The gross and histologic anatomy and material
   properties of the subregions of the
   scapholunate ligament - R.A. Berger,
   P.C. Amadio, T. Imaeda, K.N. An,
   W.P. Cooney.
   Mechanical properties of the triangular
   fibrocartilage of the wrist in simple elongation -
   S. Uchiyama, Y. Nakatsuhi, S. Satoh,
   M. Hosaka, Y. Hata, M. Itoh.
   Scaphoid and peri-scaphoid mechanism of
   injury : mathematical pattern - P. Ledoux.
   Functional analysis of the radiocarpal joint from
   a determination of the subchondral
   mineralisation pattern - M. Müller-Gerbl,
   N. Löwer, K. Wilhelm, R. Kenn, R. Putz.
10.55 - 12.00 Panel discussion
   Room A
   (Moderators : K.N. An, W.P. Cooney, A. Amis,
   R.A. Berger)
12.00 - 14.00 Lunch
14.00 - 15.20 Force analysis - lectures
   (Moderators : R. Huiskes, F. Schuind)
   Contact pressures within wrist joints -
   S.F. Viegas, R.M. Patterson.
   Finger mathematical modelling and
   rehabilitation - F. Casolo.
   Major and potential role of fibrocartilage
   meniscal-like structures in phalangeal joints.
   Intrinsic muscle insertions to the volar plate -
   T. Bryant, T.D.V. Cooke.
   Biomechanics of fracture fixation - F. Burny,
   M. Donkerwolcke.
15.40 - 17.10  **Force analysis : hand**

**Free papers, room A**

(Moderator : M.P. Rosenwasser)


Force analysis of the thumb - D.J. Glurintano, A.M. Hollister.


Anatomic forms of male and female carpometacarpal joints - G.A. Ateshian, M.P. Rosenwasser, V.C. Mow.

Biomechanics of the trapezio-metacarpal joint - G. Brunolli.


15.40 - 17.10  **Force analysis : wrist**

**Free papers, room B**

(Moderator : R. Wells)

On a model of the upper extremity - B. Peterson.

A model of the human wrist dynamics - E. Birjukova.


Kinematics and force transmission of the proximal carpal row - H.P. Kern, H.A.C. Jacob, G. Sennwald.

Biomechanical analysis of the wrist joint in ergonomical aspects - K. Gielo-Perczak.

Dynamic magnetic resonance imaging of the wrist - C. Jantea, J. Assheuer, J. Koebke.

17.10 - 18.00  **Panel discussion**

**Room A**

(Moderators : R. Huiskes, F. Schuind, M.P. Rosenwasser, R. Wells)

09.40 - 10.55  **Motion analysis : wrist**

**Free papers, room B**

(Moderator : J. Ryu)

Biomechanics of carpal motions - R. Huiskes, H. Savelberg, J. Kauer.

08.00 - 09.20  **Motion analysis - lectures**

(Moderators : F. Werner, A.K. Palmer)

Role of the wrist ligaments with respect to carpal kinematics and carpal mechanism - J.N.G. Kauer, H.H.C.M. Savelberg, R. Huiskes, J.G.M. Kooloo.

The study of the biomechanics of wrist movements in an oblique plane - P. Saffar.


Three-dimensional in-vivo kinematic analysis of finger movement - S. Fioretti.

09.20 - 09.40  Coffee-break.

09.40 - 10.55  **Motion analysis : hand**

(Moderator : L. Hagberg)


Biomechanics of a bidigital finger system with anatomical restrictions : the significance for the exercising hand of the musician.


Three-dimensional four variables plot for the study of the metacarpo-phalangeal joint kinematics - A. Meroll, P. Tranquilli Leali, S. Fioretti, T. Leo.

09.40 - 10.55  **Motion analysis : wrist**

**Free papers, room B**

(Moderator : J. Ryu)

Biomechanics of carpal motions - R. Huiskes, H. Savelberg, J. Kauer.
Functional anatomy of the carpus in flexion and extension and in radial and ulnar deviations - V. Feipel, M. Rooze, S. Louryan, M. Lemort.


Changes in the triangular fibrocartilage complex articular disk during forearm rotation: a study of configuration and surface strains - B.D. Adams.

10.55 - 12.00 Panel discussion
Room A
(Moderators: F. Werner, A.K. Palmer, L. Hagberg, J. Ryu)

12.00 - 14.00 Lunch

14.00 - 15.20 Clinical applications: lectures
(Moderators: V.C. Mow, S.F. Viegas)

Kinematic dysfunction of the distal radioulnar joint after distal radial fracture - R.L. Linscheid.


Biomechanical analysis of modified silastic trapezial arthroplasty - J. Ryu.

Two stage flexor tendon reconstruction using silicon rods - P.N. Soucacos, A. Beris, A. Touillatos, P.K. Soucacos, G. Mitsionis.


15.40 - 17.25 Clinical applications: hand
Free papers, room A
(Moderator: M. Garcia-Elias)

Standardized radiographic measurements of the metacarpo-phalangeal joint - T. Bryant, T.D.V. Cooke.

Cementless total replacement of the trapezio metacarpal joint: principle of anchorage - P. Ledoux.


In vivo measurement of tendon forces - F. Schuind, W.P. Cooney, K.N. An.

X-ray stereophotogrammetric examinations of flexor tendon excursion adhesions in the flexor tendon sheath area - L. Hagberg.

Changes in the geometry of the carpal tunnel contents due to wrist posture and tendon load: an MRI study on normal wrists - R. Wells, P. Keir.

EVAMAIN: computerized system for the assessment of the hand - J.L. Thonnard, L. Plaghi, D. Bragard.

15.40 - 17.25 Clinical applications: wrist
(Moderator: R.L. Linscheid)

The dislocation and instability of the distal radio-ulnar joint - A. Kapandji.


Load-displacement characteristics of the scaphoid ligament complex in vivo - J.J. Crisco, S.W. Wolfe, R. Brown.

Kinematics of the scapho-trapezoid joint of the wrist - C. Jantea, K.N. An, R. Linscheid.

The use of cine-computed tomography to investigate carpal kinematics - S. Wolfe, L. Katz, J.J. Crisco.

Surgical treatment with external fixator for posttraumatic carpal instability - K. Shimada, M. Nishino, T. Kadowaki, T. Yamamoto.

17.25 - 18.00 Conclusions
Room A

18.30 - 23.00 Visit of central Brussels and dinner in the city.
Congress information

Venue
Château du Lac, avenue du Lac,
B-1322 Genval, Belgium
Tel. (32.2) 654 11 22 - Fax (32.2) 653 62 00.

Language
English.

Information for presenters
Free papers are limited to 15 minutes (9 min talk + 6 min discussion). Lectures are allocated 20 minutes (14 min talk + 6 min discussion).

Slides: single or double projections are available (Kodak carroursels). Use 35 mm slides in 50 x 50 mm plastic mounts. The preview room is open on May 22 and May 23 from 07.15 to 18.30, and on May 21 from 16.00 to 18.30. Each presenter should check with the technician in the preview room and introduce himself to the moderator of his session. Poster or video presentations are not accepted.

Under the auspices of the NATO Science Committee, a comprehensive publication will result from the Workshop. Presenters should provide their full original manuscript by May 31, 1992.

Accommodation
At the Château du Lac or at the Auberge de Waterloo with coach transport to the Château du Lac. Reservations will be made on a first come first served basis.
Price: 21500 BEF (includes 3 nights' bed and breakfast at the Château du Lac, 3 dinners, single).

Travel information
The Brussels International Airport has flight connections from many major cities in Europe and USA. Coach transport from and to the airport is organized on May 21 and May 24. Dr Sabri will meet you on May 21, 15 min prior to the departure of the bus, at the Airport meeting point, in front of the 'Old Brussels Taverne' (Level arrivals).

Timetable :

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<td>Auberge de Waterloo</td>
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Genval may also be reached by car (15 min from Brussels on Highway E411 Brussels-Namur-Luxembourg).
# Registration form to be filled in and returned as soon as possible

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<tr>
<th>Name</th>
<th>Title</th>
<th>Country of citizenship</th>
<th>Institution</th>
<th>Address</th>
<th>City</th>
<th>Country</th>
<th>Zip</th>
<th>Phone</th>
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<th>Arrival date</th>
<th>Departure date</th>
<th>Special requests (dietetics, etc.)</th>
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Please fill in below as appropriate

- [ ] Registration fees 10000 BEF
- [ ] Coach transport to Paris 6000 BEF
- [ ] Accommodation (single) 21500 BEF
- [ ] Accommodation (double) 25000 BEF

*Note: the price does not include lunches, dinners or social activities for the accompanying person - to be paid during the Workshop days*

**TOTAL** BEF

My registration and accommodation fees are paid as follows:

- [ ] Enclosed check
- [ ] Money order to Belgian account (Assubel-Epargne nr 861-0321566-06)
- [ ] Money order to US account (First Bank - Rochester, MN nr 4202812312)

**SIGNATURE**

**DATE**