ADVANCES IN THE BIOMECHANICS AND MANAGEMENT OF SPINAL DISORDERS.

23 March 2012
London

Book now:
www.imeche.org/events/S1669

Improving the world through engineering
There have been enormous advances in the application of materials and devices to spinal surgery over the past 20 years, and exciting innovations continue. However, further collaboration, and improved methods to introduce these devices, remain fundamental to the developments in this field.

This interdisciplinary symposium brings engineers, surgeons and scientists together to exchange ideas and showcase innovation. It will address common spinal conditions, linking the basic science to the surgical application. The day will comprise clinical and science sessions, covering clinical indications, mechanical evaluation of spinal instrumentation, bone interface and cage mismatch.

**THIS EVENT WILL ATTRACT:**
- Engineers
- Surgeons
- Medical engineering students
- Biomaterial scientists
- Physiotherapists
- Osteopaths
- Spinal implant manufacturers and product developers

**BENEFITS OF ATTENDING:**
- Gain a deeper understanding of the problems associated with spinal implants
- Stimulate research in this much-needed area
- Relate the biomechanics of the spine to the development of new and better products

“This was an exceptionally useful forum for getting a cross-functional view and updates on spinal biomechanics and surgery. You just can’t read this in a book!”

DELEGATE AT SPINAL BIOMECHANICS AND USE OF MATERIALS IN SPINAL SURGERY, MARCH 2010

**SPONSORSHIP AND EXHIBITION OPPORTUNITIES**
Your involvement with our events is an effective way to get into the minds of key decision makers, helping you capture your chosen audience when they are in the frame of mind to do business.

Our flexible opportunities allow you to:
- Showcase new products
- Raise awareness of your operation
- Improve perception of your brand
- Influence other organisations’ spending plans

To talk through how to get the best from one of our events, contact Aman Duggal
T +44 (0)20 7973 1309
sponsorship@imeche.org
09:00 REGISTRATION AND REFRESHMENTS

CLINICAL SESSION: INDICATIONS AND PROBLEMS

09:40 SPINAL TRAUMA

- Spinal trauma
- Mechanisms of injury and fracture patterns
- Issues of instability and operative stabilisation

Mr Nasir A Quraishi*, Mr Bronek M Boszczyk
*Consultant Spinal Surgeon and Honorary Consultant Lecturer, Centre for Spinal Studies & Surgery, Queen’s Medical Centre

Mr Quraishi is an award-winning international presenter, author of several publications in peer-reviewed journals, a faculty member of many international spine societies and also qualified in law. He leads numerous local and international projects and is a part-time PhD student studying the Health-Related Quality of Life outcome after Surgery for Spinal Tumours.

09:50 DEGENERATIVE CONDITIONS

Mr Mike Hutton

10:00 SPINAL INFECTION/SPINAL METASTASES

- Overview of spinal infection
- The modern-day management for spinal metastases
- Spinal reconstruction for infection and tumour

Mr David Cumming, Consultant Spinal Surgeon, Ipswich Hospital NHS Trust

Mr Cumming graduated from Glasgow University in 1999 and, after his basic surgical training, had spinal training under the guidance of Mr Sharp and Mr Powell at Ipswich Hospital as a specialist registrar, with a further year of training as a Spinal Fellow at the Royal Devon & Exeter Hospital, before taking up a consulting post in Ipswich in 2011.

10:10 THE CHALLENGE OF SPINAL INSTRUMENTATION IN THE OSTEOPOROTIC SPINE

- Basic biomechanics of pedicle screw fixation
- Problems associated with spinal fixation in osteoporosis
- Current strategies available to enhance spinal fixation in osteoporosis
- Associated limitations/complications of available strategies

Mr Lennel Lutchman, Spinal Consultant, Norfolk & Norwich Hospital

Mr Lutchman graduated from the University of the West Indies in 1994. Following his basic surgical training, he moved to East Anglia to do higher surgical training with a Spinal Fellowship in Brisbane. He has worked at the Norfolk & Norwich Hospital as a Spinal Consultant since 2006.

10:20 DISCUSSION

10:30 REFRESHMENTS

SCIENCE SESSION:

10:55 THE MECHANICAL EVALUATION OF SPINAL INSTRUMENTATION

- What is the purpose of mechanical evaluation?
- Testing for physiological equivalence and/or safety performance
- Loading regimes
- The relevance of the instantaneous axis of rotation

Dr Donal McNally, Reader in Bioengineering, University of Nottingham

Dr McNally’s research into spinal mechanics has spanned more than 20 years and has been recognised by a number of international and national awards, including the 2009 International Society for the Study of the Lumbar Spine Prize for Basic Science and Biomechanics.

11:10 MATERIALS IN SPINAL SURGERY

Professor David Hukins

11:25 STRENGTH OF BONE AND DISC IN PATHOLOGY

- Vertebrae and intervertebral discs form a segmented weight-bearing column
- Vertebrae are stiff whereas discs are tough
- In the healthy adult, discs and vertebrae have similar strength
- Age-related pathology weakens vertebrae more than discs, and intensifies stress concentrations in both

Professor Michael Adams, Professor of Biomechanics, University of Bristol

After completing his PhD studies, Prof Adams joined the Mechanical Engineering Department of the University of Westminster, becoming a Research Fellow in 1980. He moved to the Department of Anatomy at University of Bristol in 1987, and is currently Professor of Biomechanics at the Centre for Comparative and Clinical Anatomy. He has received several awards and honours for his published papers and has contributed to a number of books.

11:40 MATERIALS – THE SURGEON’S PERSPECTIVE

Professor Max Aebi

11:55 DISCUSSION

INDUSTRY SESSION:

12:05 TRABECULAR METAL TECHNOLOGY

- Trabecular Metal: How is it manufactured?
- Trabecular Metal: Mechanical properties

Dr Claude Rieker, Director of Scientific Affairs, Zimmer GmbH

Following his PhD studies at the University of Neuchâtel, Dr Rieker became a Design Engineer at Protek. He became Head of the Hip Development department before moving to Zimmer in 1996, where is currently Director of Scientific Affairs. He is a board member of ISTA (International Society of Technology in Arthroplasty) and a member of the Swiss Society of Biomaterials.
**12:15 NON-METALLIC PEDICLE SYSTEMS**  
Dr Philippe Maxy, Medtronic

---

**12:25 ROUND TABLE DISCUSSION**

---

**13:10 LUNCH**

---

**CLINICAL SESSION: INDICATIONS AND PROBLEMS**

**14:00 THE INDICATIONS FOR LUMBAR INTERBODY CAGES AND THE PROBLEMS WITH THE CAGES**
- Rationale and indications of lumbar interbody fusion
- Development of lumbar interbody fusion and the different types of lumbar interbody fusion
- Current cage designs
- Desirable characteristics of cage systems

Mr Daniel Chan, Consultant, Princess Elizabeth Orthopaedic Centre, Royal Devon & Exeter Hospital

Mr Chan qualified from University College, Dublin in 1982, moving on to further postgraduate orthopaedic training which included Fellowships in Spinal Surgery in Leeds and Hong Kong. He was appointed as Consultant to the Princess Elizabeth Orthopaedic Centre at the Royal Devon & Exeter Hospital in 1996 and has since been practising full-time spinal surgery.

---

**14:15 VERTEBRAL BODY REPLACEMENT**
- Indications
- Present cage systems
- The ideal cage

Mr David Cumming, Consultant Spinal Surgeon, Ipswich Hospital NHS Trust

---

**14:30 DISCUSSION**

---

**SCIENCE SESSION:**

**14:45 VERTEBRAL BODY – THE END-PLATE**
- The end-plate has a vital nutritional and mechanical role in the function of the spine
- Improved understanding of the biomechanics of the end-plate may help in the management of lumbar spinal disorders

Mr David Sharp, Consultant Orthopaedic Spinal Surgeon, Ipswich Hospital NHS Trust

Mr Sharp trained at St Mary’s Hospital Medical School, London and received orthopaedic training in Birmingham and the Royal Postgraduate Medical School, London. He is currently a Spinal Surgeon and Research Lead in the Spinal Unit at Ipswich Hospital. His research interests include outcome assessment in spinal surgery, management of discogenic pain, foraminal stenosis and the vertebral end-plate in spinal surgery.

---

**15:00 THE INTERFACE BETWEEN, AND THE MIS-MATCH OF, INTERBODY CAGES AND THE VERTEBRAL END-PLATE**
- Why is the vertebral end-plate of interest in fusion?
- Load transfer between the disc and the vertebral end-plate
- Modelling load transfer
- The effect of footprint size and lack of congruity on end-plate mechanics
- A mechanism for clinical failure

Dr Donal McNally, Reader in Bioengineering, University of Nottingham

---

**15:15 DISCUSSION**

---

**15:30 REFRESHMENTS**

---

**16:00 COMPLIANT REPLACEMENT DISCS – DESIGN CONSIDERATIONS**
- Biomechanics
- Materials
- Clinical Performance

Dr Geoffrey Andrews, Founder Director, Ranier Technology

Dr Andrews is the founder of Cambridge based Ranier Technology, a medtech company engaged in the development, manufacture and sales of novel intervertebral disc prostheses designed to mimic the biomechanics of the natural lumbar and cervical disc. Dr Andrews in the principal inventor of the materials technology and device designs which underlie Ranier’s Cadisc L and Cadisc C ‘elastomimetic’ lumbar and cervical replacement disc implants.

---

**16:10 KEYNOTE SPEAKER**
**WHAT WILL SHAPE THE FUTURE OF SPINAL SURGERY: TECHNOLOGY OR BIOLOGY?**

Mr John O’Dowd

---

**16:30 ROUND TABLE DISCUSSION**

---

**17:10 CLOSING REMARKS**

---

**17:20 SEMINAR ENDS**

---

This programme is subject to change.

The Institution is not responsible for the views or opinions expressed by individual speakers.
FORWARD THINKING

21 FEBRUARY 2012
NOTTINGHAM
SMALL SPECIMEN TESTING FOR EFFECTIVE MATERIALS ANALYSIS
Join expert researchers in their discussions of testing, analysis and applications of test data for use in engineering critical assessments.
www.imeche.org/events/S1495

29 FEBRUARY 2012
LONDON
ENGINEERING STRATEGIES TO PREVENT SOFT TISSUE DAMAGE
This free lecture will focus on soft tissue damage, in the form of pressure ulcers, evaluating what has been learned from engineering approaches to inform clinical practice around this debilitating condition.
www.imeche.org/events/L243

21 APRIL 2012
LONDON
LESSONS LEARNT: PREVENTING ARTIFICIAL JOINT FAILURES
This unique event will afford patients and their carers the opportunity to discuss with engineers, surgeons and regulators what has led to recent failures in total joint replacement and debate how future failures can be prevented.
For further information, please contact health@imeche.org

JOURNALS
Professional Engineering Publishing is the publisher for the Institution of Mechanical Engineers. For more information about our magazines, journals and conference proceedings visit www.uk.sagepub.com/imeche
You may be interested in:
• Journal of Engineering in Medicine (Proceedings of the Institution of Mechanical Engineers, Part H)
IMechE members benefit from a significant discount on this publication and others. To find out more contact Subscriptions on +44 (0)1952 214050 or email subscriptions@imeche.org

MEMBERSHIP
Professional registration with us is an internationally recognised benchmark of quality. It opens up avenues of opportunity you never knew existed. New paths, new perspectives; new projects, new partnerships.
If you are in the business of research, design, development, manufacturing, installation, contracting or teaching, we have a level of membership for you.
To find out more, drop us a line at membership@imeche.org or Tel: +44 (0)20 7304 6999.

The Institution of Mechanical Engineers is the professional body representing over 94,000 mechanical engineers worldwide. As a Learned Society, the Institution seeks to be a source of considered, balanced and impartial information.

Manufacturing Excellence promotes and supports the best of manufacturing in the UK through:
• An in-depth self-assessment of your business with a FREE benchmarking report
• The prestigious Manufacturing Excellence Awards
• Industry events to share best practice methods
Further information is available at www.imeche.org/manufacturingexcellence

PLAY IT BACK
PLAYITBACK gives you a second chance to catch up with many lectures you have missed, helping you find out the latest advances from the comfort of your desktop.
Selected pay-to-enter events will feature on PLAYITBACK too (for a nominal fee). To try out this exciting new service, head for www.imeche.org/playitback

Institution of Mechanical Engineers
1 Birdcage Walk
Westminster
London SW1H 9JJ
T +44 (0)20 7222 7899
www.imeche.org
ADVANCES IN THE BIOMECHANICS AND MANAGEMENT OF SPINAL DISORDERS.

BOOKING FORM

For added convenience, you can also book online at:
www.imeche.org/events/S1669

REGISTRATION (PLEASE COMPLETE IN CAPITALS)

Name

First Name

Title

Last Name

Institution

Membership No

Name of Organisation (for name badge)

Address for Correspondence

Town/City

Postcode

Country

Contact Telephone

Fax

Email

Do you have any special requirements?

How did you hear about this event? Direct Mail □ Website □ Colleague □ Other □

FEES AND CHARGES (PLEASE COMPLETE THE APPROPRIATE BOX)

Registration fees include entry to the sessions, refreshments, lunch and a copy of the event proceedings.

Fee VAT Total £

Institution of Mechanical Engineers Member

£230.00 £46.00 £276.00

Member of Supporting Organisations

£230.00 £46.00 £276.00

Non-Member

£280.00 £56.00 £336.00

Retired Member

£65.00 £13.00 £78.00

Student

£25.00 £5.00 £30.00

Extra Items

Invoice Charging (if applicable)

£10.00 £2.00 £12.00

Total

Please do not send payment separately from this booking form.

PAYMENT DETAILS

Payment must accompany this registration form. Registration will be confirmed only on receipt of full payment.

Please indicate method of payment: Cheque □ Credit Card □ BACS □ Invoice □ (see below)

Cheques should be made payable to IMechE and crossed. Please note overseas delegates may pay only by credit card, BACS or banker’s draft. A copy of the draft must accompany this form. It is the delegate’s responsibility to pay any bank charges.

Credit Card: Visa □ MasterCard □ (please note we cannot accept American Express, Diners Club or Maestro)

Card No

Valid From / / Expiry Date / /

Name of Cardholder

Billing Address of Cardholder (if different from above)

Amount to be Deducted

Signature

INVOICE DETAILS (UK DELEGATES ONLY)

Delegates wishing to be invoiced must provide an order number. If your company does not use order numbers please include a formal request for invoicing on your company’s letterhead. A charge of £10 + VAT will be made to cover additional administration costs. Invoices are payable on receipt and no alterations to these terms will be accepted.

Order No

Contact Name

Name and Address for Invoicing

Postcode

Tel

Fax

BACS bank transfers can be made to: IMechE Current Account, NatWest Charing Cross Branch.

sort code: 60-40-05 Acc No: 00817767

Swift Code: NWBSGB2L

A copy of the draft must accompany this form.

Please complete and return this form to:

Event Registrations
Institution of Mechanical Engineers
1 Birdcage Walk
London SW1H 9JJ

Fax +44 (0)20 7222 9881

For registration enquiries call Tina Churcher on +44 (0)20 7973 1258 or email t_churcher@imeche.org

Please read the information listed below as each booking is subject to IMechE’s standard terms and conditions.

Conditions of Booking

Completed application forms should be returned to the address below, along with the correct payment. Attendance at the event will be confirmed on receipt of the full balance. All participants are advised to bring a copy of their confirmation with them on the day, to ensure the fastest possible entry.

Special Requirements

Please inform us of any special requirements is dietary or access, on the relevant section of this form.

Cancellation

For a refund (minus £5 + VAT admin charge), cancellations must be received at least 14 days prior to the event. Replacement delegates are welcome at any time. The IMechE reserves the right to cancel any event. In this case, the full fee will be refunded unless a mutually convenient transfer can be arranged. In the event that IMechE postpones an event for any reason and the delegate is unable or unwilling to attend on the rescheduled date, you will receive a full refund of the fee paid.

IMechE is not responsible for any loss or damage as a result of a substitution, alteration or cancellation/postponement of an event. IMechE shall assume no liability whatsoever in the event this conference is cancelled, rescheduled or postponed due to a fortuitous event. Act of God, unforeseen occurrences or any other event that renders performance of this conference impracticable, illegal or impossible. For purposes of this clause, a fortuitous event shall include, but not be limited to: war, fire, labour strike, extreme weather or other emergency.

Please note that while speakers and topics were confirmed at the time of publishing, circumstances beyond the control of the organisers may necessitate substitutions, alterations or cancellations of the speakers and/or topics. As such, IMechE reserves the right to alter or modify the advertised speakers and/or topics if necessary without any liability to you whatsoever. Any substitutions or alterations will be updated on our web page as soon as possible.

Supporting Organisations

Members of the supporting organisations listed on page 2 can register at our members’ rates

Venue

This event will be held at One Birdcage Walk, Westminster, London SW1H 9JJ.

Details will be sent upon registration.

Liability

The organisers do not accept liability for any injuries or losses of any nature incurred by delegates and/or accompanying persons, nor for loss or damage to their luggage and/or personal belongings.

Accommodation

We have arranged special discounted rates at local hotels via the Corporate Team.

Tel: (UK only) 0845 604 4060

International: +44 (0)20 7972 3505

Email: events@corporateteam.com

www.corporateteam.com/events/8488ME

Enquiries

For event enquiries please call Alison Roddam on 020 7304 6823 or email a.roddam@imeche.org

The Institution of Mechanical Engineers is a registered charity (No 206882)

VAT No GB 299930493

A B C D