

UK Focus for
Biomedical Engineering



ROYAL
ACADEMY
of
ENGINEERING

Engineering
Better
Medicine

A CONFERENCE

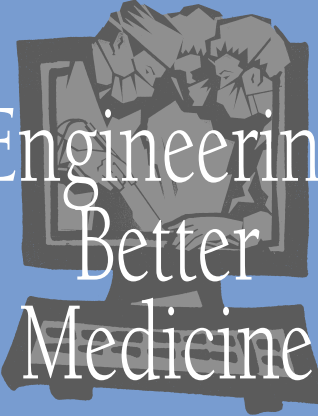
AT

THE ROYAL SOCIETY OF MEDICINE
1 WIMPOLE STREET LONDON W1

MONDAY 30th APRIL 2001

25 years

Promoting
Excellence in
Engineering



Engineering Better Medicine

The pace of medical discovery and invention shows no sign of slackening. The practice of medicine, however, is increasingly constrained by what is affordable. New technologies often disrupt existing clinical practice and inflate costs. It is these technologies that, although often highly effective, have stimulated the development of cost containment policies, using approaches such as prioritisation and rationing. Such negative approaches have led to tension and disappointment amongst patients, healthcare purchasers, healthcare providers, politicians and the public.

The purpose of this Conference is to highlight the positive ways in which new technologies, particularly those based on engineering, improve the practice and effectiveness of modern medicine. By taking four examples - information management, enhancing independent living, education, and imaging - the essential role of engineering will be examined in the context of administration, clinical care, empowerment and education and opportunities for the future will be identified and analysed. The Conference will culminate with a keynote lecture by a prominent speaker.

The Conference is designed to meet the needs of people responsible for planning, financing and managing health services, as well as clinicians, engineers, scientists and industrialists who seek a concise and coherent assessment of the impact and potential of engineering to improve medicine.

UK FOCUS FOR BIOMEDICAL ENGINEERING

ENGINEERING BETTER MEDICINE

09.45 Registration

10.15 **Chairman's Introduction**
Professor William Bonfield CBE FREng
 Professor of Medical Materials, University of Cambridge

MANAGING AND USING INFORMATION

10.20 **Hospital Information Systems**
Professor Adrian Wilson
 Director of Clinical Physics & Bioengineering, Warwick University

- Support for the clinical decision making process
- Appropriate human computer interaction
- Looking towards tomorrow's technology today
- Modelling is an essential element for progress

10.40 **Telesurgery: Operating at a Distance**
Professor Licinio Angelini
 Professor of General Surgery, La Sapienza University, Rome

- Why operate remotely?
- What is the state of the art?
- What problems remain?

11.00 **NHS Direct – Engineering the Provision of Healthcare**
Mr John Dale
 General Manager NHS Direct (Avon, Gloucestershire and Wiltshire)

- Origins of the species - Origins and set up
- Warp Speed - The story so far
- Current Mission - The current agenda
- Boldly going.....? - Possibilities for the future?

11.20 COFFEE

ENHANCING INDEPENDENT LIVING

Chairman Dr Patrick Magee
 Consultant in Anaesthesia and Intensive Care,
 Royal United Hospital Bath

11.50 **Functional Electrical Stimulation (FES) for Health and Therapy**
Dr Nick Donaldson
 Implanted Devices Group, University College, London

- FES to restore function in daily life
- Improving health by recreational FES-cycling
- Recovery of natural function using electrical stimulation

12.10 **Smart House Technology for People with Dementia**
Dr Roger Orpwood
Head of Engineering, Bath Institute of Medical Engineering

- Dementia as a disability
- Technology emulating carers
- New designs for a smart house

12.30 **New Technologies and New Possibilities in Health Monitoring**
Mr Peter Range
Business Manager Telehealth, Motion Media Technology

- Scottish “Smart Home” project selects high-tech consortium for healthcare
- Impact of new video communication technology in healthcare
- Remote patient consultations and diagnosis via videophone and nurse led call centres
- Medical device technology companies adding vision to monitor citizen’s health

12.50 Discussion

13.15 LUNCH

ENABLING EDUCATION AND TRAINING

Chairman Dr Mark Tooley
Consultant Senior Lecturer, Bristol University and
United Bristol Healthcare NHS Trust

14.30 **21st Century Technology in Medical and Dental Training**
Mr Mark Brennan
Dental Health and Development, University of Wales College of
Medicine, Cardiff

- Changes in training over the last decade
- Greater use of educational technology and new forms of assessment
- Ensuring the patient still comes first
- Balancing new technology with traditional methods

14.50 **Physiological Simulators**
Dr Frances Forrest
Consultant Anaesthetist, United Bristol Healthcare NHS Trust

- A description of the Human Patient Simulator
- Teaching anaesthesia in a safe environment
- The role of the simulator as a teaching or evaluation tool
- The future of such simulators in anaesthesia

15.10 **Surgical Simulators**
Professor Ara Darzi
Professor of Surgery, Imperial College of Science,
Technology and Medicine

- What’s available – including inanimate and VR simulation
- Validating simulation and assessing surgical dexterity
- Using simulators to understand the impact of environmental factors on surgery

15.30 TEA

SEEING INSIDE THE HUMAN BODY

Chairman Professor Peter Wells FEng
Centre for Physics and Engineering Research in Medicine,
Bristol University and United Bristol Healthcare NHS Trust

16.00 **New Imaging Methods**
Professor David Delpy FRS
Vice Provost & Former Head of Medical Physics & Bioengineering
Department, University College, London

- Imaging methods from gamma rays to radio frequency with few unexplored gaps
- New sources and detectors employing new materials and microscale engineering
- “Functional” with “anatomical” imaging to provide greater spatial resolution
- New imaging techniques in clinical applications and in development

16.20 **Information from Images**
Professor David Hawkes
Head of Computational Imaging Science Group, Kings College, London

- Why? Correspondence between all my images, between my images and your images and between your images and you.
- How? Algorithms for rigid things, deformable things and different things.
- Where? Brains, bones and breasts.

16.40 **Taking Risks to Make a Diagnosis**
Dr Francis Duck
Head of Medical Imaging Physics, Royal United Hospital, Bath

- Risks involved in using ionising radiation for imaging
- The growth in use of Ultrasound and Magnetic Resonance Imaging
- Perception of risk and alternative imaging technologies
- Alternative imaging technology – alternative risk?

17.00 Discussion

17.30 TEA

EVENING LECTURE AND DINNER

Chairman Sir David Davies CBE FEng FRS
President, The Royal Academy of
Engineering

1800 **From Clinical Data to
Health Care Information**
Professor Mike Brady FEng FRS
BP Professor of Information Engineering,
University of Oxford

1840 Discussion

1900 RECEPTION

1930 DINNER

2130 Close

BOOKING FORM

ENGINEERING BETTER MEDICINE

at
THE ROYAL SOCIETY OF MEDICINE
MONDAY 30th APRIL 2001

Registration fee: £175 (including VAT) on or before 12th April 2001
£215 (including VAT) from 17th April 2001

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FIRST NAME	
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ORGANISATION	
ADDRESS FOR CORRESPONDENCE	
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TEL:	FAX:

NB: Please confirm that you will attend the
Evening Lecture YES
NO

Please confirm whether you wish to attend the dinner
(an additional £30, including VAT, should
be added to the above registration fee) YES
NO

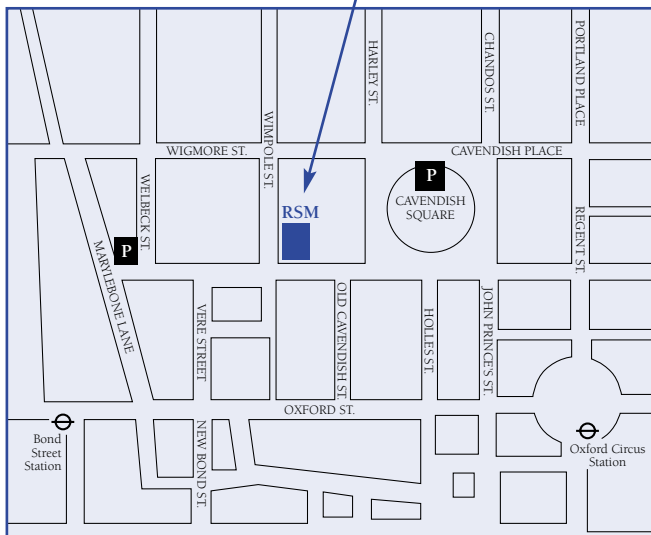
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RETURN TO:
External Affairs
The Royal Academy of Engineering
29 Great Peter Street
London SW1P 3LW

The Royal Society of Medicine, 1 Wimpole Street, London W1





UK FOCUS FOR BIOMEDICAL ENGINEERING

The UK Focus for Biomedical Engineering was established in 1993 under the auspices of The Royal Academy of Engineering. Its origins date back to 1987 when The Academy, then known as The Fellowship of Engineering, was invited to submit evidence to the House of Lords Science and Technology Committee enquiry into priorities in medical research. This led to the formation of a working party to investigate the role of engineering in medicine and launched The Academy's involvement in the field. The working party concluded that a focus for biomedical engineering in the UK was necessary to assist developments in policy and to co-ordinate activities and so the UK Focus for Biomedical Engineering came into being. Membership comprises a range of professional groups involved in the field, including the Institute of Physics and Engineering in Medicine, the Institutions of Mechanical, Electrical and Chemical Engineers, the Institute of Materials, the Departments of Health and Trade and Industry, the Engineering and Physical Sciences, Biotechnology and Biological Sciences and Medical Research Councils, medical charities and the Association of British Healthcare Industries. The Royal Academy of Engineering provides a number of representatives, including the Chairman, Professor William Bonfield CBE FREng.

THE ROYAL ACADEMY OF ENGINEERING

The objectives of The Royal Academy of Engineering are to pursue, encourage and maintain excellence in the whole field of engineering in order to promote the advancement of the science, art and practice of engineering for the benefit of the public.

The Academy comprises the United Kingdom's most eminent engineers of all disciplines. It is able to take advantage of their wealth of knowledge and experience which, with the interdisciplinary character of the membership, provides a unique resource with which to meet the objectives.

Its activities include an extensive education programme, research chairs and fellowships, visiting professorships, industrial secondments and international travel grants. It provides expert advice on engineering matters to government and other bodies and administers the UK's premier annual prize for innovation in engineering, The Royal Academy of Engineering MacRobert Award.

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