

EULOGY FOR DR JANE B GREENING

Dr Jane Greening passed away peacefully on the 30th of October 2022 after a long illness. To sum up a person's professional life in a few words never seems enough, particularly when the person concerned has made seminal discoveries which have had profound and ongoing impact for clinical, educational and research practices.

Isaac Newton said of himself:

“I do not know what I may appear to the world, but for myself I seem to have been only like a boy playing on the seashore and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me.”

For us this describes Jane's life beautifully. She didn't assume, she always questioned and was not put off by answers not being readily available. Observations of patient's presentations were the basis for her clinical and research work and when this led to further questions she was not put off by the effort of finding answers. The patient was central to her work and there was never a personal agenda.

Jane trained as a physiotherapist at The London Hospital and qualified in 1975. She started working clinically at The London hospital and developed a particular interest in Respiratory Care. The patient load consisted of people with chronic respiratory problems, post-surgical and Intensive Care scenarios. After two years she went to work at Preston Hall hospital where she specialised in ITU work. The main attraction, apart from making the patient breathe better and therefore be more comfortable, was the fine balance of drug use in combination with rehabilitative intervention. It was a collaboration between Doctors, Physiotherapists and Nurses and gave opportunity for questioning and discussion of what would give the best outcome for the individual patient. It was challenging and important work which allowed her to develop collaborative skills which she used for the rest of her professional life.

During these years Jane married Trevor and in 1979 had their son Ross and the Lizzie their daughter arrived in 1981.

Jane took a career break and when she felt ready to return decided to do a course in 1986 and 1987 which at the time was called “The Married Women Refresher Course”. The course was designed and led by Jill Guymer, an expert in neuromusculoskeletal physiotherapy. So inspirational was the course that Jane decided to go into the field of musculoskeletal clinical practice.

Jane's constant hunger for knowledge and wish to understand why patients presented with a particular set of signs and symptoms led her to do a MSc in Musculoskeletal Physiotherapy at University College London, with clinical links to the Middlesex Hospital, in 1992.

The exposure to high level research scientists during her MSc, not least in neurophysiology, excited her and provided a perfect setting for her to try to get some answers for her every increasing questions.

Timing sometimes plays a crucial part in a person's development and at this time there appeared to be an increase in the number of patients presenting with arm pain with non-traumatic onset. The symptoms were often debilitating to the point of the person not being able to perform activities of daily living and not able to work. The condition was particularly prevalent amongst secretaries and journalists at the time when the old-fashioned typewriter was still in use and the introduction of the PC had just started.

Typically, the patient would present to their GP, who would prescribe painkiller and anti-inflammatory drugs. When the symptoms did not abate, there was a tendency to attribute the symptoms to mental health issues and the use of Valium and anti-depressants were introduced. The patients consistently told the same story: their symptoms had presented after increased use of the PC or working long hours at the typewriter. A group of journalists brought a case against their employer quoting the work conditions as being the root of their problems. The case was lost as the expert witnesses employed who were learned doctors, stated that there was no evidence in the literature demonstrating the aetiology or indeed the existence of the condition, RSI as it was then referred to. It was therefore not a condition to be recognised. In his summing up statement in 1993, Judge Prosser, concluded that RSI was a condition mainly suffered by hysterical women.

This was the backdrop to Jane's interest in this population of patients. As a musculoskeletal physiotherapist she knew that many if not all the patients she saw, had specific limitations of the mobility of the large nerves which supplied the sensory and motor function of the upper limb. There were tests, commonly used by physiotherapists, that demonstrated the direct link between limitation of nerve mobility and symptom production of the kind found in RSI patients. These tests were not used by doctors. The common tests to establish neural integrity such as reflex testing, sensory testing of light touch and pin prick, did not pick up the physiological integrity of the nervous system. The dynamic testing of nerve mobility which had been developed mainly in Australia and published in the physiotherapeutic press, was not read, or accepted by the medical profession.

Jane decided to test for vibration thresholds as the first sign of neurophysiological involvement. She set up a series of experiments investigating the median nerve in patients with RSI symptoms and non-symptomatic subjects. The function tested was their threshold response to vibration using a tuning fork. In her MSc thesis Jane was able to demonstrate the significant difference in the response of the two groups, so describing the neurophysiological differences in the symptomatic group. This work paved the way for many more questions and further research.

Jane's work with RSI led to The Lancet's news announcement of – "Repetitive Strain Injury is real – its official!" This highlighted that her research had shown that RSI is caused by damage to sensory nerves supplying the hand providing the first concrete evidence that RSI exists and making a real difference to numerous patients. It is important to mention at this point the excitement this research brought to the scientific members of staff at UCL and to the physiotherapists involved. This was true clinical scientific collaboration looking at ultimately improving the lives of a large population of patients.

Jane completed her PhD in 2000 and was awarded the Schaefer Prize (Faculty of Life Sciences) from University College London for distinction in research. Jane's contribution to physiotherapy research cannot be underestimated and that research has directly contributed to the MACP. Her research contribution from her PhD onwards can be described in 3 phases.

1. Use of high frequency ultrasound to characterise nerve longitudinal movement using cross-correlation of successive images. This work enabled understanding of nerve biomechanics during positioning, particularly the median nerve. The technique enabled quantification of reduced transverse movement of the median nerve at the wrist in patients with carpal tunnel syndrome; and reduced longitudinal movement following whiplash injury and in patients presenting with non-specific arm pain, accompanied by signs of neural mechano-sensitivity.
2. Use of shear wave elastography to quantify stiffness of nerves during movements providing a further opportunity to evaluate nerve biomechanics.
3. Use of MRI imaging leading to a publication in The Lancet identifying reduced function associated with both small and large sensory fibres in patients with non-specific arm pain and additionally, for the first time, a functional change related to sympathetic fibres. More recently this has progressed to new magnetic resonance neurography techniques to identify peripheral nerve inflammation and pathology at the wrist and more recently in the brachial plexus that contributes to symptoms.

Jane's research was at the forefront of musculoskeletal discovery combining the basic and clinical sciences highlighting for us clinically the potential role of the nervous system in pain, specifically the potential contribution of minor peripheral nerve injury to musculoskeletal pain. Jane navigated the interface of the basic and clinical sciences effortlessly with an unbending focus on quality in everything she did, whether that was precise neurodynamic positioning of the upper limb for imaging or hours of pouring over images to develop new methods of analysis. This passion remained to the end of her life, illustrating its importance to her.

Alongside her research career Jane contributed impactful leadership to the MACP. She served on the Executive Committee and was Chairperson of the MACP from 2001 to 2004 and was described by her Vice Chair Chris McCarthy as having a gentle, kind and humerus manner that gave her great authority as a leader. As Chair, Jane was proactive in particularly moving the Association towards research through strategic initiatives, that included:

- Facilitation of the PDC to develop a portfolio of courses on evidence based practice, with a focus on clinically based topics.
- Commissioning funded work to develop the MACP. For example, Roger Kerry's work on Cervical Artery Dysfunction.
- Enabling the Course Approval Board's governance of educational standards to be published and then adopted by IFOMPT to inform its processes of International Monitoring.
- Through the communications officer, promoting the MACP to the press office at the CSP, and encouraging the CSP to actively seek help and advice from the MACP on matters relating to musculoskeletal medicine.

Jane also lectured extensively since 1997 both in the UK and abroad, primarily on the nervous system, vibration thresholds, non-specific arm pain, whiplash injury and carpal tunnel syndrome. She taught postgraduate students working towards MACP membership and existing members. Since 1995, Jane was a member of the Editorial Advisory Committee for Manual Therapy, and later Musculoskeletal Science and Practice. Jane was awarded a fellowship of the MACP in 2006 for her contributions to musculoskeletal physiotherapy.

In summary, Jane's professional life was captured by two passions, her research and the MACP. Her personal life was captured by her family; as a wife, mother, and grandmother and by her friendships with many of us who were fortunate to know her.

Thank you, Jane, for everything and you will be greatly missed, while the discoveries that are only possible because of your research will continue.