

PROFESSOR JOHN GOLDMAN: A REMARKABLE INNOVATOR IN THE TREATMENT OF LEUKAEMIA AND AN INSPIRATIONAL MENTOR FOR THOUSANDS WORLDWIDE

Professor John Goldman played a leading international role in the development of ground-breaking and highly effective treatments for patients with blood cancers. His passionate commitment to the importance of translating basic scientific advances into routine clinical care, coupled with a selfless work ethic, led to the development of a range of new drug and transplant therapies which have transformed the outcome of hundreds of thousands of patients with blood cancers across the world. His remarkable and varied contributions to the diagnosis, monitoring and treatment of leukaemia will be remembered for two centrally important discoveries. Firstly, he played a leading role in the development of new molecular targeted drugs for the treatment of chronic myeloid leukaemia (CML), demonstrating the enormous therapeutic potential of molecular targeted treatments in the management of many cancers. Secondly, his vision and clinical advocacy established the concept that unrelated, but genetically matched individuals, could serve as stem cell donors for patients with blood cancer who lacked a suitably matched family donor and led to the establishment of the Anthony Nolan Registry, the first unrelated bone marrow donor registry in the world.

For over four decades, Professor Goldman led the international drive to develop new treatments for CML, a blood cancer that until 40 years ago was universally fatal. In 1980 he was the first clinician in the UK to perform a transplant from a matched sibling donor for a patient with CML and he subsequently founded an internationally renowned transplant programme at the Hammersmith Hospital. He went on to pioneer the use of volunteer unrelated donors in CML, extending treatments for patients with CML. In addition, he was the first to demonstrate the presence of stem cells in the peripheral blood of CML patients and to pioneer their use in autologous transplants. As a central part of this work, in which for the first time patients with CML were able to benefit from potentially curative therapies, he was the first to apply a fundamental advance in molecular biology, the polymerase chain reaction (PCR) which can detect at an extremely sensitive level of residual leukaemia, to the monitoring of treatment efficacy in patients with cancer. This work transformed the post-transplant management of patients with CML across the world. Realising that many patients with CML were unable to undergo the rigours of bone marrow transplantation, he played a pivotal role in developing a new and extraordinarily drug treatment for CML- the tyrosine kinase inhibitor (TKI), Imatinib. In 1997 he confirmed the pre-clinical efficacy of Imatinib and he was one of the first clinicians internationally to document its remarkable efficacy in the clinic. Integral to the development of both Imatinib and newer generation TKIs, notably Dasatinib, Nilotinib and Bosutinib, was Professor Goldman's unique insight into the clinical applicability of basic scientific advances coupled with his leadership in clinical trial design which ensured patients benefited as rapidly as possible from fundamental advances in our understanding of cancer biology.

Professor Goldman's other massive contribution to the treatment of blood cancers was his pivotal role in establishing unrelated donor stem cell transplantation as a curative treatment for large numbers of children and adults with blood cancers. Having played a leading role in establishing the curative potential of bone marrow transplants from a matched sibling donor, Professor Goldman next turned to the challenge posed by the fact that more than 70% of patients lack a suitably matched sibling donor. In 1988 when Professor Goldman helped establish the Anthony Nolan Bone Marrow Trust (later renamed Anthony Nolan) in London and became its first Medical Director, the majority of adults and many children with leukaemia and other blood cancers were untransplantable and consequently were destined to die of resistant leukaemia within months of diagnosis. As Medical Director of Anthony Nolan from 1988 until 2010, Professor Goldman arguably did more than anyone else in the world to demonstrate the life-saving potential of unrelated donor stem cell transplantation providing that large registries of adult unrelated donors could be established. Many of the principles on which the current international network of unrelated registries were established by Professor Goldman and now include more than 20 million volunteer donors. Subsequently his work in improving tissue typing technologies and transplant practice resulted in dramatic improvements in the outcomes of unrelated donor transplants so that in 2012 outcomes are equivalent to those achievable using a matched sibling donor. As a result of this visionary and unstinting work (much of which was performed in a climate of professional and establishment scepticism or opposition), Professor Goldman played a pivotal role in Anthony Nolan growing from a small operation run from a portakabin to a well organised programme which now facilitates stem cell transplants for more than 1000 patients with leukaemia and other blood diseases a year. At the same his tireless advocacy, unflinching honesty and remarkable openness and capacity for clinical innovation has resulted in unrelated donor transplantation becoming the international standard of care for patients with high risk leukaemia who lack a sibling donor. In 1994, realising the huge international significance of his work, Professor Goldman established the World Marrow Donor Association (WMDA) of which he was the first General Secretary. The WMDA now serves as the central organisation coordinating the recruitment and welfare of volunteer unrelated donors globally.

Professor Goldman was a gifted and inspiring communicator and his commitment to dissemination of medical advances is evidenced by his numerous roles as Founding President of the British Society for Blood and Marrow Transplantation. He always had a deep commitment to fostering medical education and scientific research in Europe and was a Founding Member and then President of the European Haematology Association (EHA) and former President of the International Society for Experimental Hematology and the European Group for Blood and Marrow Transplantation (EBMT). His commitment to patients with blood cancers in the developing world has been consistently manifest by his generosity in hosting training fellows at the Hammersmith Hospital and tirelessly visiting haematology units across the world to lecture and to provide mentoring. More recently he became Chairman of the Trustees of the International Chronic Myeloid

Leukaemia Foundation, a UK registered charity that aims to improve management of CML in less wealthy countries in Asia, Africa and South America. Despite these multiple commitments he was founding Editor of the journal *Bone Marrow Transplantation* and an Editorial Board Member of *Blood* and numerous other journals. During the course of his career, he published over 800 papers in peer-reviewed journals and gave the prestigious Ham-Wasserman Lecture to the American Society of Hematology in 1997.

Professor Goldman will be remembered by thousands of clinicians and patients whose lives he touched and changed profoundly. He was a uniquely effective and generous mentor and under his leadership thousands of medical students and scientists were given a unique training in haematology delivered with wisdom and liberal humanity. Always open to new ideas he was endlessly supportive of innovation and the importance of original thinking. Most importantly his tireless commitment to improving clinical outcome by combining basic science with clinical practice has transformed the therapeutic landscape for a multitude of current and future patients with blood cancer.