



# Nuclear Accidents - A Management Challenge

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It has become apparent that a large-scale terrorist nuclear attack involving either a nuclear bomb (full or dirty) or a high-energy source concealed in for instance a Metro system, could lead to a significant number of people being irradiated but potentially survivable that is many orders larger than has occurred in previous nuclear accidents such as Chernobyl. Care of patients whose marrow have been lethally irradiated but are otherwise uninjured will depend upon a logistic exercise how these patients can be distributed amongst a large number of centres containing the necessary expertise to deliver haemopoietic support. To this end, The European Blood and Marrow Transplant Group (EBMT) consists of 500 centres distributed through Europe (25 countries) and also some centres in India, the Middle East and the United States of America. It was originally a registry founded in 1973 but is now an electronic network with a secretariat in Barcelona. It is dedicated to furthering the research and state of the art treatment associated with patients who are in bone marrow failure, and although many require bone marrow transplants, the clinicians involved have the skills for treating patients with bone marrow failure, which includes antibiotics, anti-fungals, anti-virals, blood products, growth factors and an understanding of immunology, microbiology and protective environments. There is an annual meeting with up to 5000 attendees and a series of disease or technology based sub-committees. Prospective trials are now undertaken supported by an electronic database. The clinicians working within the centres are experts at treating haematological malignancies with chemotherapy and all the attendant haemopoietic support that is required. It is this set of skills and not bone marrow transplantation which these centres would bring to the support required for irradiated victims. After September 11, 2001, the Board of the EBMT set up a

Nuclear Accident Sub-Committee to address this problem and has since had four meetings with representatives from leading European countries, including input from Ministries of Health and Defense. So far there has been collaboration with WHO – REMPAN, AFRRI, CDC Atlanta, The IRSN in France, the IAEA, the Indian BMT Network and the University of Ulm. A chain of command has been structured for activation in the event of a nuclear release. Issues to be addressed relate to funding, stock-piling of drugs, the writing of suitable protocols, and the analysis of data accrued. The skills that treating units will bring are centered around bone marrow support for a period of up to six weeks and the portfolio of these supportive measures is the basis of the protocol. As a working plan, arrangements are being made to handle 1000 patients who have been exposed to between 4 and 10 Gy and it is expected that there would be at least a 3-day delay before serious bone marrow failure occurred, which would allow for transportation throughout Europe. If a disaster occurred, the EBMT would be in a position to turn the exercise into a scientific research resource that could be used to rationalize and optimize the level of care delivered at any future disaster.

A logistic plan with time lines has been put in place to have this network operational within 12 months. In conclusion, the EBMT can provide a network of specialist centres throughout Europe that can give haemopoietic support to patients in bone marrow failure using a unified standard operating procedure for an agreed protocol for the use of antibiotics, platelet support and protected environments. Collaboration between bodies with common objectives, across the globe is required and there is a need to maintain a prospective database of centres that can contribute.