Ongoing worldwide shortage of medical isotopes could threaten patient care, says expert

March 18 2009

A University of Nottingham expert is calling on the Government to provide substantial new investment into the production of medical isotopes or face a dangerous shortage that threatens to compromise patient healthcare.

Alan Perkins, Professor of Medical Physics at The University of Nottingham and President Elect of the British Nuclear Medical Society (BNMS), will tell the BBC's Material World today that a series of disastrous setbacks in the worldwide production of radionuclides had recently caused disruption to clinical services. Although the recent crisis has now passed we now need to "plan for failure" to ensure the future provision of essential diagnostic imaging procedures for thousands of UK patients.

Professor Perkins said: "The medical use of radionuclides is probably the single most beneficial application of atomic and nuclear sciences to mankind. I am advocating further investment in alternative means for producing medical radionuclides for the benefit of patients who desperately need them."

Technetium-99m (Tc-99m) is used as a radioactive tracer in nuclear medicine investigations such as gamma cameras, which allow doctors to see inside a patient's body to track down damaged organs and tissues and diagnose a range of life threatening diseases, including cancer, heart

problems and renal failure.

Globally, nuclear medicine investigations are the second most common diagnostic imaging procedure after x-ray CT and more than 28 million procedures are carried out each year using Tc-99m. Around 80 per cent of clinical nuclear medicine work is dependent on the routine availability of the radioisotope molybdenum-99 (Mo-99), from which Tc-99m is derived, which has a half-life of three days and cannot therefore be stockpiled.

Ninety-five per cent of the world's Mo-99 is produced by five commercial nuclear reactors — NRU at Chalk River in Canada, HFR at Petten in The Netherland, BR-2 at Fleurus in Belgium, OSIRIS at Saclay in France and SAFARI-1 at Pelindaba in South Africa. The UK has no facility for producing Mo-99 of its own. Until fairly recently, production and worldwide distribution were fairly reliable and distributors had managed to arrange contingencies to ensure supplies during scheduled reactor down time or critical shut down.

However, a series of unavoidable maintenance issues and unforeseen events in the industry have recently highlighted the fragile nature of supplies and raised concerns over shortfalls in national provision and a lack of international cooperation.

Since January 2007, there have been five periods of serious disruption to supplies, including a month outage at Chalk River to fix safety back-up systems and a six-month shut down of the Petten reactor from August 2008 after corroded pipes were discovered in its primary cooling circuit.

Professor Perkins added: "The recent supply disruptions at the end of 2008 and early 2009 have adversely affected patient services in many countries including the UK, the majority of Europe, the USA and Canada and beyond.

"In the UK, the supply of Mo-99 to some hospital departments was down to 30 per cent of normal levels. As a result departments have had to prioritise to make the most effective and efficient use of supplies and ensure that tests were provided for those patients most in need.

"However, with pressure on hospitals in England to provide tests within six weeks, there has been concern that this may not have happened in all cases and that priority would be decided based on waiting lists and not clinical judgement."

Professor Perkins added that Britain needed to seriously consider investing in its own production facilities to reduce its reliance on the foreign reactors, which are all more than 40 years old and are approaching their time for decommissioning.

International concern over medical isotope shortages led to an International Workshop on the Security of Supply of Medical Isotopes at the Organisation for Economic Cooperation and Development (OECD) in January of this year. Organised by the Nuclear Energy Agency (NEA), it led to a unanimous agreement between producers, distributers, national societies and clinical professionals to work together by exchanging materials, information and strategic support.

Source: University of Nottingham (news : web)