

Through its human health programme, the International Atomic Energy Agency responds to the needs of Member States, enhancing their capacity to prevent, diagnose and treat health problems by applying nuclear techniques.

"The Agency shall accelerate and enlarge the contribution of atomic energy to peace, health and prosperity."

The IAEA human health programme provides technical expertise in the use of nuclear techniques in four major areas:

- Nutrition
- Nuclear Medicine and Diagnostic Imaging
- Radiation Oncology and Cancer Treatment
- Dosimetry and Medical Radiation Physics

#### Division of Human Health

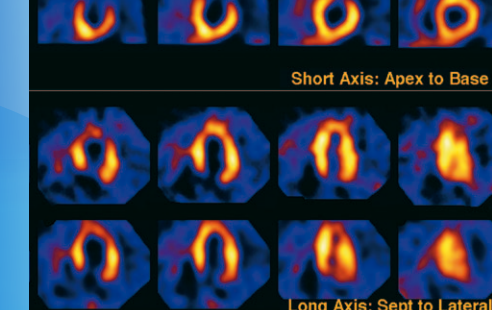
Department of Nuclear Sciences  
and Applications

International Atomic Energy Agency  
Vienna International Centre  
P.O. Box 100  
1400 Vienna  
Austria

Telephone: +43 1 2600 21658  
Fax: +43 1 26007  
nahu@iaea.org  
[www-naweb.iaea.org/nahu](http://www-naweb.iaea.org/nahu)



Human  
Health  
Programme



# Human Health





Every day, some 26 000 children under the age of five years die around the world, mostly in low income countries, from preventable causes such as inadequate nutrition and medical care. In particular, the importance of adequate nutrition during early life cannot be overestimated. Poor health and undernutrition often overlap in young children, with illness resulting in undernutrition, and vice versa, leading to a vicious cycle.

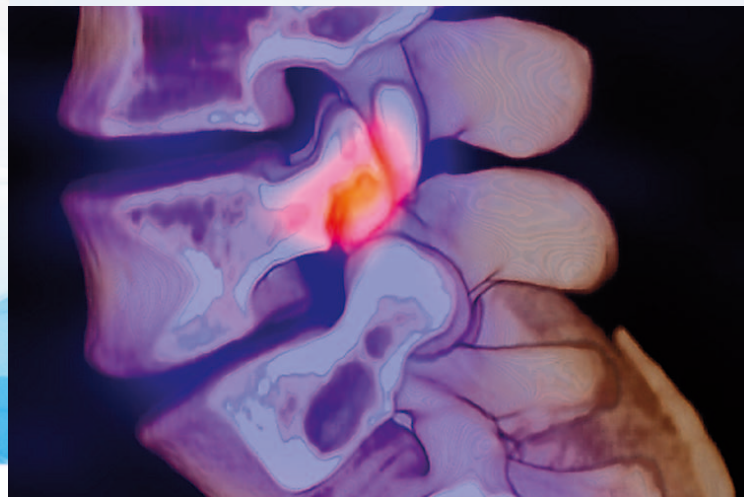
Using its unique expertise, the IAEA assists Member States in addressing this crucial challenge by providing technical expertise in the use of stable isotope techniques in the development and evaluation of nutrition interventions. As a complement to mainstream activities in the area of nutrition, stable isotope techniques are being used to measure human milk intake in breastfed infants, lean body mass (muscle mass) in lactating mothers, and bio-availability of iron in infants and young children. Stable isotope techniques add value by increasing the sensitivity and specificity of measurements compared with conventional techniques.



Every year, hundreds of thousands of nuclear medicine examinations are conducted around the world using radiopharmaceuticals that can be used to assess diseases at the molecular level. Diagnostic images are generated to help diagnose and treat major disorders and illnesses such as heart disease and cancer.

Positron emission tomography (PET) in oncology and single photon emission tomography (SPECT) in cardiology and other areas provide unique functional information that can be combined with anatomical data obtained by magnetic resonance imaging (MRI) or computed tomography (CT), allowing a more precise localization of cancer or cardiac abnormalities and increasing the accuracy of the studies.

The IAEA helps establish new nuclear medicine facilities, encouraging their integration with diagnostic radiology procedures, by facilitating appropriate human resources capacity building, thus helping Member States to achieve and maintain high standards of professional practice. Through services and programmes such as the Quality Assurance in Nuclear Medicine (QUANUM) programme, the IAEA provides tools for improving the practice of nuclear medicine around the world.



By 2020, up to 15 million people worldwide will be diagnosed with cancer every year, with 70% of these new cases occurring in the developing world. The IAEA provides expertise in radiation oncology, in particular in the medical use of radiation for the treatment of diseases, mostly cancer. To address the shortage of cancer treatment resources, the IAEA works with a variety of stakeholders, including other agencies within the United Nations, governments, hospitals and research institutes.

Through its Programme of Action for Cancer Therapy (PACT), the IAEA assists in the development of comprehensive cancer control and management strategies around the world, establishing and upgrading radiotherapy centres and organizing training courses. The IAEA also promotes research and clinical applications of radiation in repairing tissue damage. Currently, technical expertise is provided to over 140 projects directly addressing cancer management in 73 countries.



Medical procedures utilizing radiation play a central role in modern health care. To ensure maximal benefits and minimal risks, it is essential that these techniques rely on adequate dosimetry and medical physics procedures. In therapeutic procedures, accurate dose measurement and delivery are critical for effectively treating patients. In diagnostic imaging, quality assurance processes enable accurate image generation with minimal radiation dose to patients and medical personnel. In all branches of radiation medicine — including radiation therapy, diagnostic radiology and nuclear medicine — comprehensive quality assurance programmes are essential.

The IAEA contributes to ensuring the safe and effective use of radiation in medicine through its activities in dosimetry and medical radiation physics. Traceable dosimetry calibration services are provided through the IAEA/WHO Network of Secondary Standards Dosimetry Laboratories. Independent dosimetry audits and comprehensive clinical audits are offered to radiation medicine facilities worldwide.

