



IAEA

International Atomic Energy Agency

Atoms for Peace and Development

A Selection of Records From the
International Nuclear Information System
Applicable to the:

International Conference on Hybrid Imaging (IPET 2024)

7 – 11 October 2024, Vienna, Austria

INIS Bibliography



Resources. Day 1

1

Clinical Applications of SPECT/CT

*International Atomic Energy Agency (2021),
IAEA Human Health Series; (no.41); 83 p. Vienna, Austria*

Abstract

Hybrid imaging including SPECT/CT, has experienced significant developments, improvements and a positive impact in recent years, and has now an important place in several procedural guidelines. The technology has matured, and more data are available to appraise its clinical role. For these reasons, we have developed this publication to emphasize classical indications in SPECT/CT imaging, and highlight new fields in which SPECT/CT is being adopted providing relevant information with regard to patient management. This publication is intended for nuclear medicine physicians, radiologists and clinical practitioners to support them in their clinical decision making process when allocating resources dedicated to the health care system. This is a critical issue that is especially important for the development of nuclear medicine in developing countries. Medical imaging is an integral part of patient management, and the objective of this publication is to provide a list of the most common indication of SPECT/CT in clinical practice. The IAEA hopes that this publication will be of help for the medical professionals and staff working with, as well as people interested in, SPECT/CT imaging in order to embrace the variety of hybrid imaging.

2

Guidelines for the Certification of Clinically Qualified Medical Physicists Endorsed by the International Medical Physics Certification Board (IMPCB) and the International Organization for Medical Physics (IOMP)

*International Atomic Energy Agency (2021), Dosimetry and Medical Radiation Physics Section;
Training Course Series; (no. 71); 46 p. Vienna, Austria*

Abstract

Clinically qualified medical physicists are physicists working in healthcare who have received adequate academic postgraduate education in medical physics and relevant supervised clinical training. They work as members of multidisciplinary teams that provide services to patients in radiotherapy, nuclear medicine, and diagnostic and interventional radiology. Clinically qualified medical physicists also work in other areas where ionizing or non-ionizing radiation or physics principles are used for diagnosis and treatment of patients. Imaging and therapeutic processes, procedures and interventions are dependent on the safe and effective use of information, science and technologies, and thus require qualified professionals to ensure optimal and appropriate patient care through quality assurance and optimization. The knowledge and competencies of medical physicists are acquired through academic education and clinical training programmes that fulfil internationally defined criteria. International professional organizations recognize the need for continuing education and professional development and promote the certification of medical physicists to ensure a high standard of patient care.

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3

Dosimetry for Radiopharmaceutical Therapy

Dewaraja, Yuni, & Sjögreen-Gleisner, Katarina (2024). Dosimetry for Radiopharmaceutical Therapy. International Atomic Energy Agency (IAEA), Vienna, Austria

Abstract

In this publication the basic principles of radiation physics, imaging and non-imaging instrumentation used, measurement of the administered activity, calibration procedures and methods for obtaining quantitative information on the biodistribution of the radioactive drug to be used with radioisotopes relevant to therapy are specified. It also describes methods for segmentation and registration of images acquired at different time points, strategies for fitting and integration of activity measurements over the time of treatment, absorbed dose calculations and derived dosimetric indexes with methods to estimate the overall uncertainty of different radionuclide therapies. The aim of this book is to fill the existing gaps in education and training of medical physicists on methods for patient-specific dosimetry. The overall objective of this book is to highlight the tools and methodologies to assure that radiopharmaceutical therapy is implemented through a dosimetry-guided individualized treatment approach.

4

Proceedings of the Fifth Workshop on Science and Values in Radiological Protection Decision Making

Cantone, Marie Claire, et. al. (2018). Workshop on Science and Values in Radiological Protection Decision Making; Nuclear Energy Agency of the OECD (NEA), Milan, Italy

Abstract

Four successful workshops on Science and Values in Radiological Protection Decision Making have thus far been held in 2008 (Finland), 2009 (France), 2012 (Japan) and 2015 (Russia). To continue advancing the integration of new scientific radiological protection and technological developments, and evolving the understanding of social considerations into decision making in circumstances involving the radiological aspects, the NEA Committee on Radiological Protection and Public Health (CRPPH) was prompted to organise the Fifth Workshop on Science and Values in Radiological Protection Decision Making. The fifth workshop - hosted by the University of Milan - addressed the complexity and multi-faceted nature of radiological protection situations (e.g. uncertainty and variability of scientific-social-ethical aspects, etc.) as inputs to radiological protection decision making and approaches to decision implementation. The workshop not only addressed issues that have been particularly evident in a post-accident context, but also those that were commonly seen as aspects of importance in other radiological protection circumstances. It focused on ethics and uncertainty in the context of the three following key topics: Topic A: Challenges of managing uncertainty of low-dose effects in chronic public exposure situations; Topic B: Medical screening: RP ethics and uncertainties in justification and implementation; Topic C: Ethics of radiological protection in occupational exposure situations. Aspects of justification, trust and acceptability were also addressed. In addition to this, the workshop's Italian hosts presented national radiological protection issues and research. The workshop aimed at understanding how the science and values aspects of the three topics might influence the evolution of the system of radiological protection, and how these aspects should be included and transparently articulated in radiological protection decision making.

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5

International Conference on Radiation Safety: Improving Radiation Protection in Practice. Extended Abstracts (Virtual Event)

International Atomic Energy Agency, et. al. (2021)

Abstract

The IAEA organized the International Conference on Radiation Safety: Improving Radiation Protection in Practice virtually from 9 to 20 November 2020. The Conference was organized in cooperation with the European Commission, the Food and Agriculture Organization of the United Nations, the International Labour Organization, the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development, the Pan American Health Organization, the United Nations Environment Programme and the World Health Organization. The Conference aimed to take stock of the worldwide radiation safety situation. It provided a forum for the exchange of information on Member States' experiences in applying the system of radiological protection, as provided for in the IAEA safety standards, to the protection of workers, patients, the public and the environment. Both natural and artificial radiation sources fell within the scope of the Conference. A particular focus was given to the lessons learned from applying GSR Part 3 and improvements that could be considered to further facilitate its application. Discussion on changes in approach considered necessary for effectively dealing with new and emerging challenges in radiation protection were expected and encouraged.

6

Basics of Quality Management Systems in Nuclear Medicine Practice

*International Atomic Energy Agency (2021),
IAEA Human Health Series; (no.43); 117 p. Vienna, Austria*

Abstract

A quality health service, as defined by the World Health Organization, 'is one which organizes resources in the most effective way to meet the health needs of those most in need, for prevention and care, safely, without waste and within higher level requirements'. As health care standards improve globally, providing an optimal service that meets international standards and public expectations requires effective quality management. The process of quality improvement aims at defining, measuring and setting quality standards, and overcoming the associated challenges that include rising costs and skills shortages. The objective of this publication is to provide a framework for quality management systems (QMSs) to be implemented, managed and sustained holistically in nuclear medicine departments. It builds upon the IAEA's QUANUM programme, which has successfully been implemented in more than 80 countries worldwide.

Resources. Day 1

7

Training Curriculum for Nuclear Medicine Physicians

*International Atomic Energy Agency (2019),
Nuclear Medicine and Diagnostic Imaging Section, Vienna, Austria*

Abstract

This publication addresses the different components in which any well-trained nuclear medicine physician must be competent. It stresses the importance of providing support for the implementation of the prescribed programme, thus meeting the individual needs of trainees. Likewise, it emphasizes the appropriate duration of training necessary to acquire the competencies needed to provide adequate care to patients and ensure the safety and quality of clinical practice. Moreover, the principles and practice of physics, radiochemistry, anatomy, physiology and clinical nuclear medicine, including hybrid imaging are discussed.

8

International Conference on Advances in Radiation Oncology (ICARO2). Book of Synopses

*International Atomic Energy Agency (2017),
Division of Human Health, Vienna, Austria*

Abstract

The conference was aimed at defining the current role and future potential of technological, medical physics and molecular/biological innovations for their incorporation into routine clinical practice in radiation oncology. It also provided a forum where advances in technology, best practices and quality assurance methodologies can be disseminated and scientific knowledge exchanged. The conference had the following specific objectives: - To review the current role and future potential of technological, medical physics and molecular/biological innovations for clinical use in radiation oncology; - To explore the applications of improved imaging tools in treatment planning; - To review the current status of evidence based recommendations for the treatment of common cancers; - To review the latest developments in medical dosimetry and dose auditing procedures for new radiotherapy techniques; - To review the current status of comprehensive audits in radiotherapy; - To review resource sparing approaches in clinical radiotherapy practice; - To exchange information on the current advances and implementation challenges in the field among leading experts; - To define future challenges and directions in the clinical use of radiotherapy.

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International Symposium on Standards, Applications and Quality Assurance in Medical Radiation Dosimetry (IDOS 2019). Book of Extended Synopses

International Atomic Energy Agency, et.al. (2019), Vienna, Austria

Abstract

The major goal of the symposium is to provide a forum at which advances in radiation dosimetry, radiation medicine, radiation protection and associated standards made over the last decade can be disseminated and scientific knowledge exchanged. It will cover all specialties in radiation medicine and radiation protection, with a specific focus on those areas where the standardization of dosimetry has improved in recent years (advanced radiotherapy, diagnostic radiology, nuclear medicine and audits). It will also summarize the present status of, and outline future trends in, medical radiation dosimetry and identify possible areas for improvement. The conclusions and summaries from the symposium should lead to the formulation of recommendations for the scientific community. The symposium will cover recent developments in the field of radiation dosimetry standards, applications and quality assurance. The IAEA welcomes both academic and practice based contributions on the following topics: • Radiation dosimetry measurement standards for imaging, therapy and radiation protection; • Reference dosimetry and comparisons in brachytherapy, diagnostic radiology and nuclear medicine; • Clinical dosimetry in X ray imaging, radiotherapy and nuclear medicine; • Independent dosimetry quality audits; • Radiation protection dosimetry; • Dosimetry for proton and light ion beams in radiotherapy; • Detector technology and applications in dosimetry; • Other related topics including microdosimetry, nanodosimetry, dosimetry of small animal irradiators and more.