HUMAN HEALTH

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Nutrition | Medical Physics, Dosimetry and Diagnosis | Radiotherapy | Nuclear Medicine

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The IAEA is one of the leading publishers in the area, with titles on nuclear and radiological safety, emergency response, nuclear power, nuclear medicine, nuclear waste management, nuclear law and safeguards, as well as relevant topics in food and agriculture, earth science, industry and the environment.


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Nutrition

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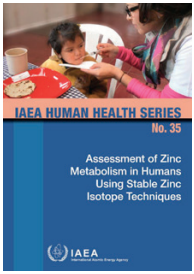

Assessment of Zinc Metabolism in Humans Using Stable Zinc Isotope Techniques

IAEA Human Health Series No. 35

(115 pp., 14 figs; 2018)
ISBN 978-92-0-108418-7
STI/PUB/1835 • **€51.00**

This publication is part of the IAEA's continuing efforts to transfer technology and to contribute to capacity building by providing information on the theoretical background and practical application of state of the art methodologies for assessing human zinc metabolism to better understand absorption, dietary bioavailability and nutritional requirements. It reviews the role of zinc in human nutrition and the application of stable isotope techniques to evaluate nutritional interventions. Advice is given on planning a study, administering isotopes, preparing and analysing samples, and calculating physiological end points. The publication was developed with input from international experts and is intended for nutritionists, analytical chemists and other professionals interested in the application of stable isotope techniques to evaluate human zinc nutrition and metabolism.

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“This is a comprehensive, yet practical introduction to the use of stable isotope techniques to understand zinc metabolism in humans.”

IAEA, Nutrition Specialist

HHS 12 SPECT/CT Atlas of Quality Control and Image Artefacts
IAEA Human Health Series No. 36

HHS 13 Atlas of Skeletal SPECT/CT Clinical Images
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TRS 14 Dosimetry of Small Static Fields Used in External Beam Radiotherapy
Technical Reports Series No. 483

TECDOC 16 Gallium-68 Cyclotron Production
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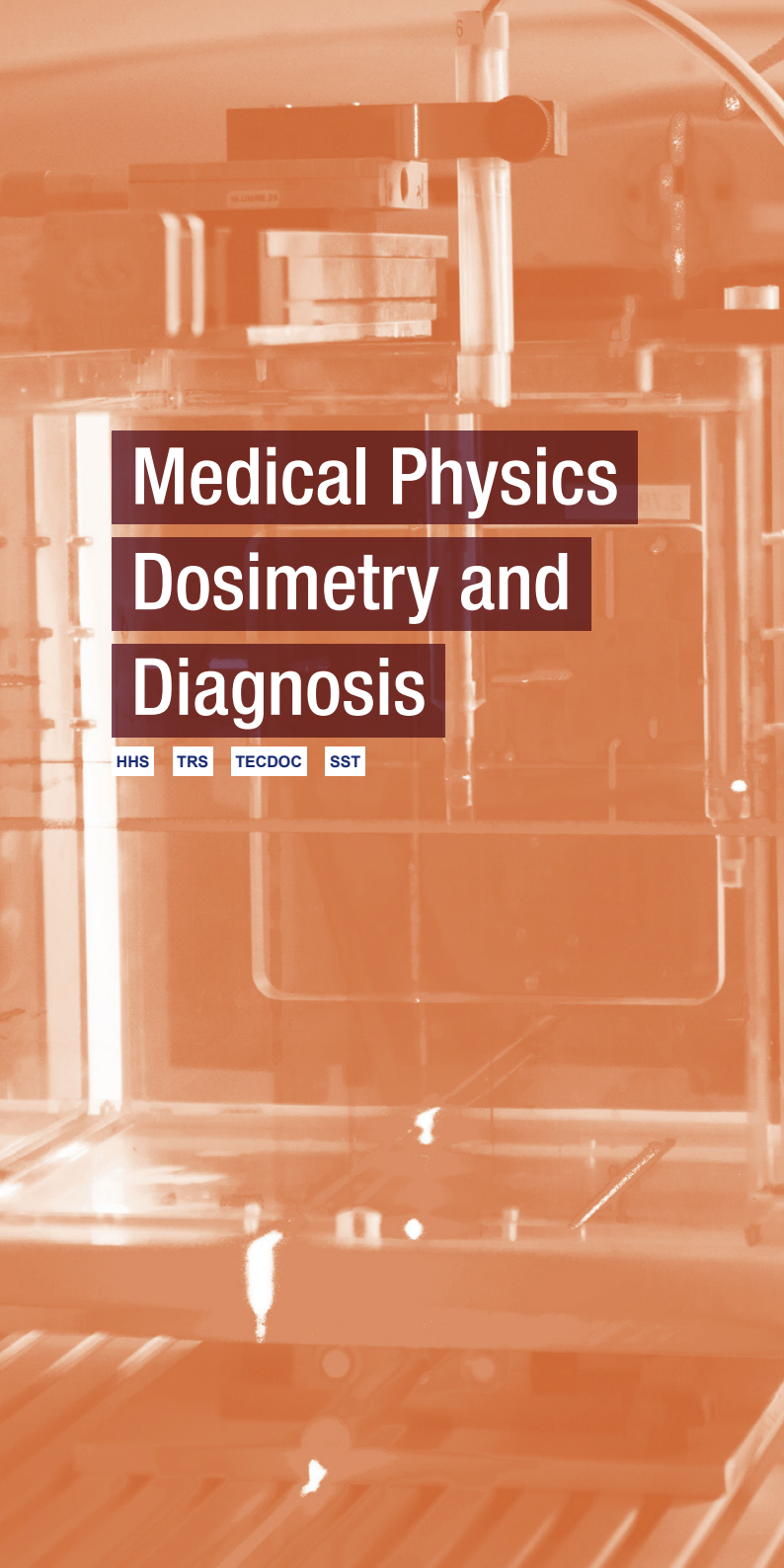

Medical Physics Dosimetry and Diagnosis

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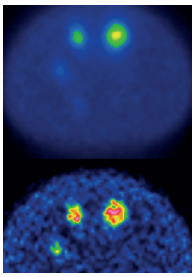

SPECT/CT Atlas of Quality Control and Image Artefacts

IAEA Human Health Series No. 36

ISBN 978-92-0-103919-4
STI/Pub/1860 • **€65.00**

Multi-modality imaging has become increasingly prevalent in nuclear medicine and diagnostic radiology. To accurately interpret single photon emission computed tomography/computed tomography (SPECT/CT) images in addition to understanding the principles of image formation and the biological distribution of the radiopharmaceutical, it is important to understand the image artefacts that can arise from these imaging systems. This atlas presents an overview of quality control procedures in SPECT and SPECT/CT and guides the reader through pitfalls and image artefacts that can be faced using these imaging modalities. In addition to examples of artefacts themselves, descriptions are given on their causes, and the steps that can be taken to avoid their recurrence. The atlas is intended to be used as a guide for nuclear medicine and diagnostic radiology professionals (medical physicists, nuclear medicine physicians, radiologists, medical radiation technologists and service engineers) on how to take appropriate quality control measures, and to assist with problem analyses and prevention.

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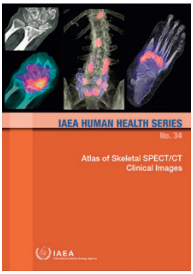

Atlas of Skeletal SPECT/CT Clinical Images

IAEA Human Health Series No. 34

(237 pp., 301 figs; 2016)
ISBN 978-92-0-103416-8
STI/PUB/1748 • **€75.00**

The atlas focuses specifically on single photon emission computed tomography/computed tomography (SPECT/CT) in musculoskeletal imaging, and thus illustrates the inherent advantages of the combination of the metabolic and anatomical components in a single procedure. In addition, the atlas provides information on the usefulness of several sets of specific indications. The publication, which serves more as a training tool than a textbook, will help to further integrate the SPECT and CT experience in clinical practice by presenting a series of typical cases with many different patterns of SPECT/CT seen in bone scintigraphy.

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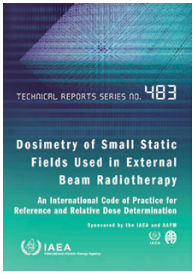

Dosimetry of Small Static Fields Used in External Beam Radiotherapy

Technical Reports Series No. 483

(211 pp., 31 figs; 2017)
ISBN 978-92-0-105916-1
STI/DOC/010/483 • **€52.00**

This is the first international code of practice dedicated to the dosimetry of small static fields used in radiotherapy. It provides consistent reference dosimetry, traceable to metrological primary standards, and enables common procedures within a country to be followed. The publication presents an overview of the physics, followed by a general formalism for reference dosimetry in small fields. Guidelines for its practical implementation using suitable detectors and methods for the determination of field output factors are given for specific clinical machines that use small static fields. The development of this code of practice has been done through an international working group, established jointly with the American Association of Physicists in Medicine. Internationally harmonized guidelines in this field will ensure worldwide consistency in dose delivery to radiotherapy patients and will contribute to dose standardization in international clinical trial studies, comparing outcomes of various radiotherapy treatment modalities using small fields.

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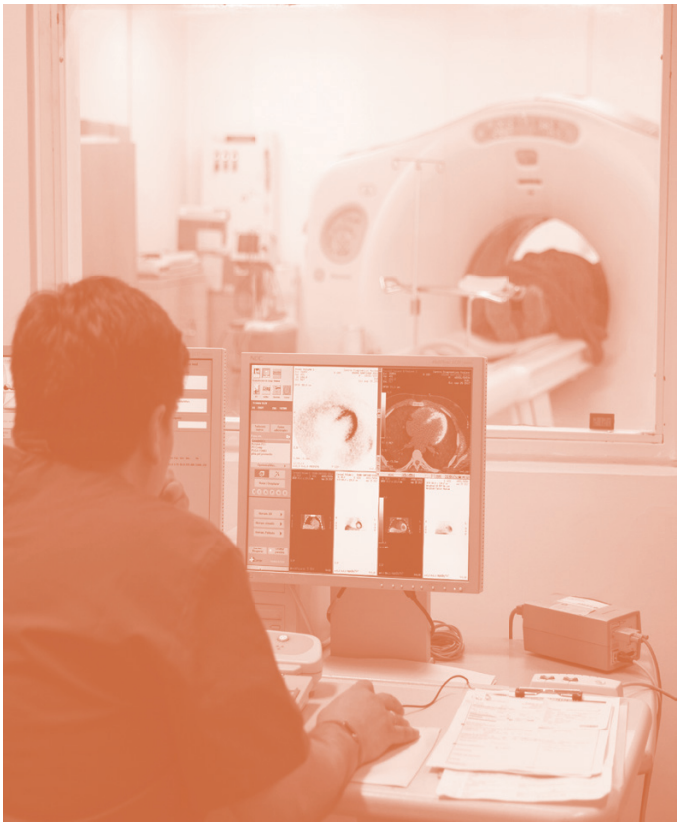

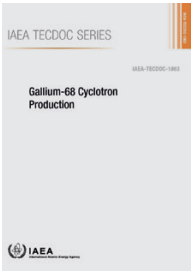

Gallium-68 Cyclotron Production

IAEA TECDOC Series

No. 1863

(66 pp., 18 figs; 2019)
ISBN 978-92-0-100819-0
IAEA-TECDOC-1863
€18.00

This publication provides a comprehensive overview of the technologies involved in the direct production of gallium-68. It serves as a specific guide for the production and quality control of metal radioisotope gallium-68 in chloride form for radiopharmaceutical production. Emphasis is given on the advances developed over the last few years. The publication, which also describes the legal matters related to the use of the targetry methods, will appeal to scientists and technologists intending to put cyclotron based radioisotope production into practice, as well as post graduate students in the field.

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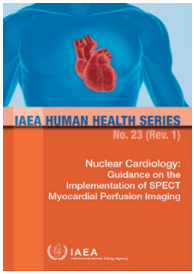

Nuclear Cardiology: Guidance on the Implementation of SPECT Myocardial Perfusion Imaging

IAEA Human Health Series No. 23 (Rev. 1)

(101 pp., 24 figs; 2016)
ISBN 978-92-0-107616-8
STI/PUB/1753 • **€46.00**

Nuclear cardiology is one of the most widely used non-invasive techniques for the assessment of coronary artery disease and other cardiovascular conditions. It has proved to be a cost effective tool for the evaluation and management of cardiac patients and usually has a decisive role for diagnosis, prognosis and risk stratification. In particular, radionuclide myocardial perfusion imaging (MPI) is used extensively worldwide for the evaluation of known or suspected coronary artery disease, with an estimated 15–20 million procedures performed annually. This publication provides a detailed analysis of all the steps involved in the delivery of nuclear cardiology services, from referrals to reporting, and is intended to serve as guidance for the implementation, homogenization and enhancement of MPI practice in those Member States where the technique is under development.

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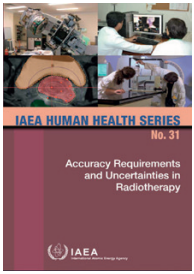
Radiotherapy

HHS HHR SST



Accuracy Requirements and Uncertainties in Radiotherapy

IAEA Human Health Series No. 31

(297 pp., 46 figs; 2016)
ISBN 978-92-0-100815-2
STI/PUB/1679 • **€76.00**

Accuracy requirements in radiation oncology have been defined in multiple publications; however, these have been based on differing radiation technologies. In the meantime, the uncertainties in radiation dosimetry reference standards have been reduced and more detailed patient outcome data are available. No comprehensive literature on accuracy and uncertainties in radiotherapy has been published so far. The IAEA has therefore developed a new international consensus document on accuracy requirements and uncertainties in radiotherapy, to promote safer and more effective patient treatments. This publication addresses accuracy and uncertainty issues related to the vast majority of radiotherapy departments including both external beam radiotherapy and brachytherapy. It covers clinical, radiobiological, dosimetric, technical and physical aspects.

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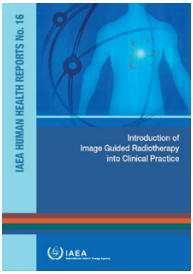

Introduction of Image Guided Radiotherapy into Clinical Practice

IAEA Human Health Reports No. 16

(39 pp., 6 figs; 2019)
ISBN 978-92-0-103218-8
STI/PUB/1827 • **€31.00**

This publication provides guidelines, and highlights the milestones to be achieved by radiotherapy departments in the safe and effective introduction of image guided radiotherapy. Recent advances in external beam radiotherapy include the technology to image the patient in the treatment position, in the treatment room at the time of treatment. Since this technology and associated image techniques, termed image guided radiotherapy, are perceived as the cutting-edge of development in the field of radiotherapy, this publication addresses the concerns of personnel in radiotherapy departments as to the preparatory conditions and resources involved in implementation. Information is also presented on the current status of the evidence supporting the use of image guided radiotherapy in terms of patient outcomes.

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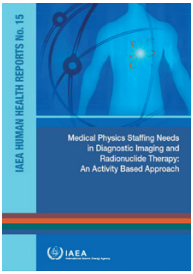

Medical Physics Staffing Needs in Diagnostic Imaging and Radionuclide Therapy: An Activity Based Approach

IAEA Human Health Reports No. 15

(23 pp.; 2018) • ISBN 978-92-0-107817-9 • STI/PUB/1797

€20.00

Over the last decades the rapid technological development of diagnostic and interventional radiology and nuclear medicine has made them major tools of modern medicine. However, at the same time the involved risks, the growing number of procedures and the increasing complexity of the procedures require competent professional staff to ensure safe and effective patient diagnosis, treatment and management. Medical physicists (or clinically qualified medical physicists) have been recognized as vital health professionals with important and clear responsibilities related to quality and safety of applications of ionizing radiation in medicine. This publication describes an algorithm developed to determine the recommended staffing levels for clinical medical physics services in medical imaging and radionuclide therapy, based on current best practice, as described in international guidelines.

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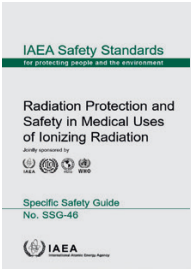

Radiation Protection and Safety in Medical Uses of Ionizing Radiation

IAEA Safety Standards

Series No. SSG-46

(318 pp., 2 figs; 2018)
ISBN 978-92-0-101717-8
STI/PUB/1775 • **€54.00**

This Safety Guide provides recommendations and guidance on fulfilling the requirements of IAEA Safety Standards Series No. GSR Part 3 for ensuring radiation protection and safety of radiation sources in medical uses of ionizing radiation with regard to patients, workers, carers and comforters, volunteers in biomedical research, and the public. It covers radiological procedures in diagnostic radiology (including dentistry), image guided interventional procedures, nuclear medicine, and radiotherapy. Recommendations and guidance are provided on applying a systematic approach to ensure that there is a balance between being able to utilize the benefits from medical uses of ionizing radiation and minimizing the risk of radiation effects to people.

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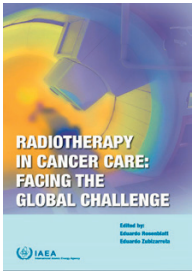

Radiotherapy in Cancer Care: Facing the Global Challenge

(544 pp., 68 figs; 2017)
ISBN 978-92-0-115013-4
STI/PUB/1638 • **€62.00**

Cancer treatment is complex and calls for a diverse set of services. Radiotherapy is recognized as an essential tool in the cure and palliation of cancer. Currently, access to radiation treatment is limited in many countries and non-existent in some. This lack of radiotherapy resources exacerbates the burden of disease and underscores the continuing health care disparity among States. Closing this gap represents an essential measure in addressing this global health equity problem. This publication presents a comprehensive overview of the major topics and issues to be taken into consideration when planning a strategy to address this problem, in particular in low and middle income countries. With contributions from leaders in the field, it provides an introduction to the achievements and issues of radiation therapy as a cancer treatment modality around the world. Dedicated chapters focus on proton therapy, carbon ion radiotherapy, intraoperative radiotherapy, radiotherapy for children, HIV/AIDS related malignancies, and costing and quality management issues.

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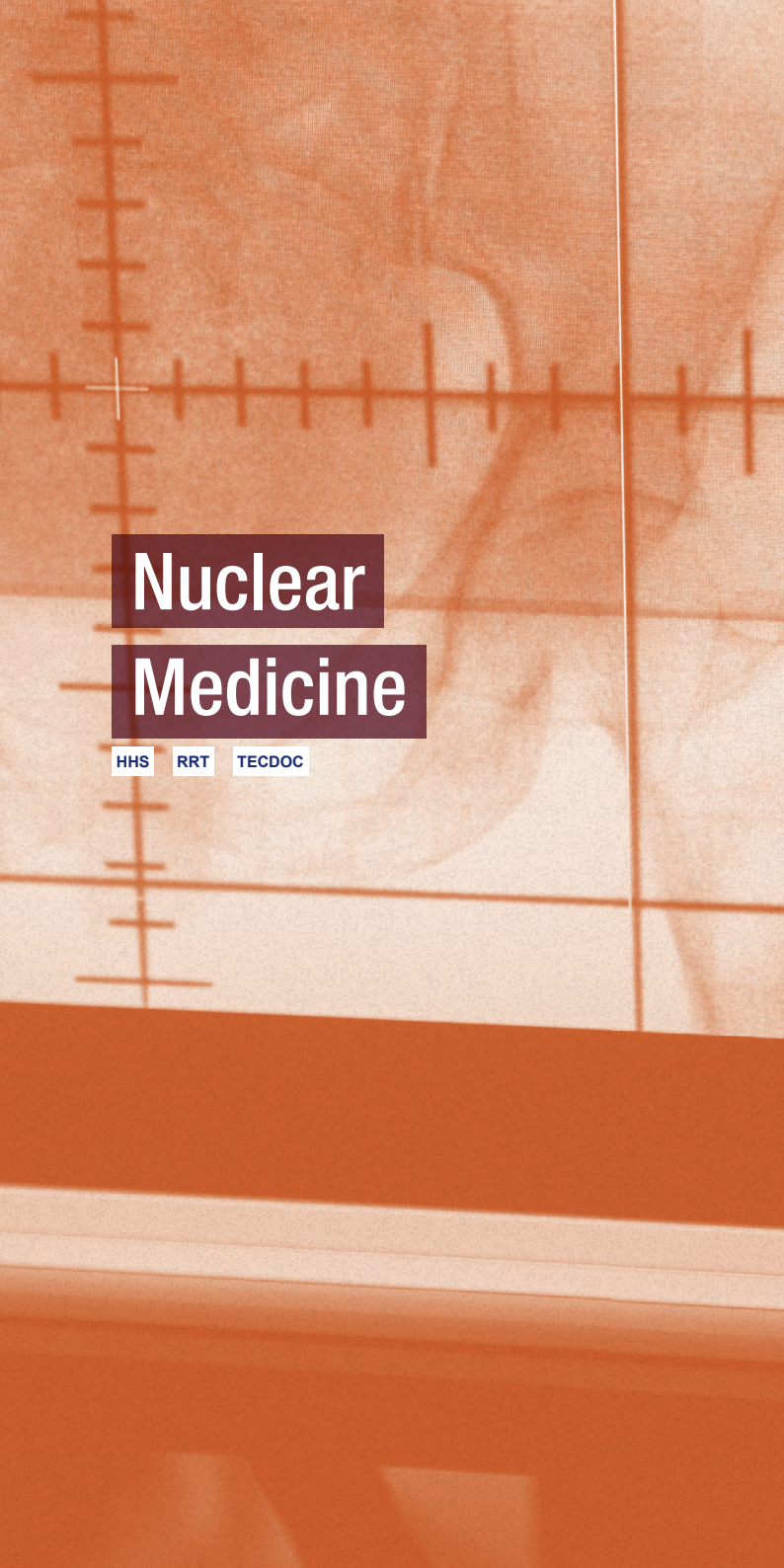

Nuclear Medicine

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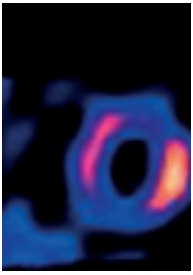

Nuclear Medicine Resources Manual: A Guide for Decision Makers

IAEA Human Health Series No. 37

ISBN 978-92-0-104019-0
STI/Pub/1861 • **€70.00**

Medical imaging is crucial in a variety of medical settings and at all levels of health care. In public health and preventive medicine as well as in both curative and palliative care, effective decisions depend on correct diagnoses. This revised edition addresses the most current needs and offers guidance on clinical practice, radiation safety and patient protection, human resource development and training required for the overall practice of nuclear medicine.

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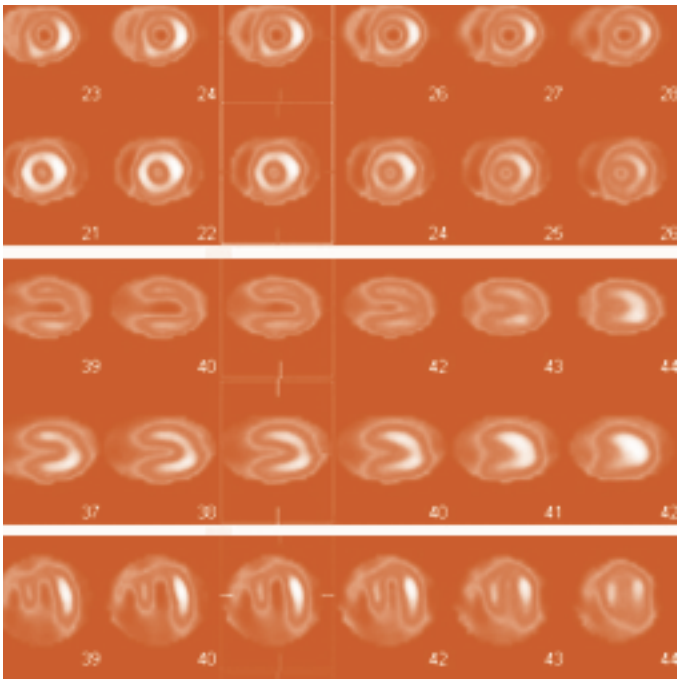
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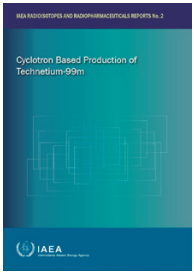

Cyclotron Based Production of Technetium-99m

IAEA Radioisotopes and Radio-pharmaceuticals Reports 2

(59 pp., 48 figs; 2017)
ISBN 978-92-0-102916-4
STI/PUB/1743 • **€33.00**

This publication presents a comprehensive overview of the technologies involved in the production of cyclotron based 99mTc. These would include techniques relevant to preparation of targets, irradiation of targets under high beam currents, target processing, target recovery and quality control of the final product. The publication provides broad information, well supported with references, on improved production routes and improved separation and purification of cyclotron based 99mTc. These approaches achieve high specific activity and chemical purity of 99mTc suitable for labelling molecules of medical interest and also enable spare capacity to be available at medical cyclotron centres. The readership of this publication is scientists interested in translating this technology to practice, technologists already working with cyclotrons wanting to enhance the utility of the existing machines and managers who are in the process of setting up facilities in their countries. Students working towards higher level degrees in related fields may also benefit from this publication.

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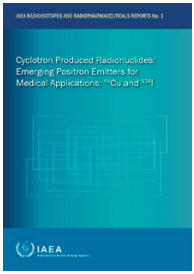

Cyclotron Produced Radionuclides: Emerging Positron Emitters for Medical Applications: 64Cu and 124I

IAEA Radioisotopes and Radio-pharmaceuticals Reports 1

(63 pp., 38 figs; 2016)
ISBN 978-92-0-109615-9
STI/PUB/1717 • **€38.00**

The growing number of medical cyclotrons and positron emission tomography/computed tomography (PET/CT) centres as well as the proven high clinical utility of fluorodeoxyglucose (FDG) in cancer patients has led to interest in possibilities for the use of PET tracers which are in different stages of clinical evaluation. This publication presents the outcome of an IAEA coordinated research project on this topic and provides a comprehensive overview of the technologies involved in the production of 64Cu and 124I, techniques on preparation of targets, irradiation of targets under high beam currents, target processing, target recovery and labelling. It provides guidance to enhance 64Cu and 124I production and applications. This book will appeal to scientists and technologists involved in putting cyclotron based radioisotope production into practice, as well as postgraduate students in the field.

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Quality Control in the Production of Radiopharmaceuticals

IAEA TECDOC Series

No. 1856

(148 pp., 5 figs; 2018)
ISBN 978-92-0-107918-3
IAEA-TECDOC-1856
€18.00

Advances have led to the production of new radiopharmaceuticals and availability of new production routes. Various new diagnostic agents in the field (such as Ga-68 radiopharmaceuticals and generators) as well as therapeutic agents (such as alpha emitters) have been added to the clinician's menu. It is essential that radiopharmaceuticals are prepared within a robust quality control system encompassing materials and personnel, with adequate documentation, and continuous review of ongoing results. This publication provides guidelines and best practices for the quality control of medical radioisotopes and radiopharmaceuticals. It was written by a group of experts with experience across a range of radiopharmaceuticals and is intended to support professionals in the preparation of good quality and safe products to be used in nuclear medicine procedures.

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