

# Committee 3

## “Radiological protection in medicine”

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Réunion CIPR France

1er décembre 2023



INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION

Registered with the Charity Commission for England and Wales (#1166304)

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ICRP C3 member

IRSN

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+

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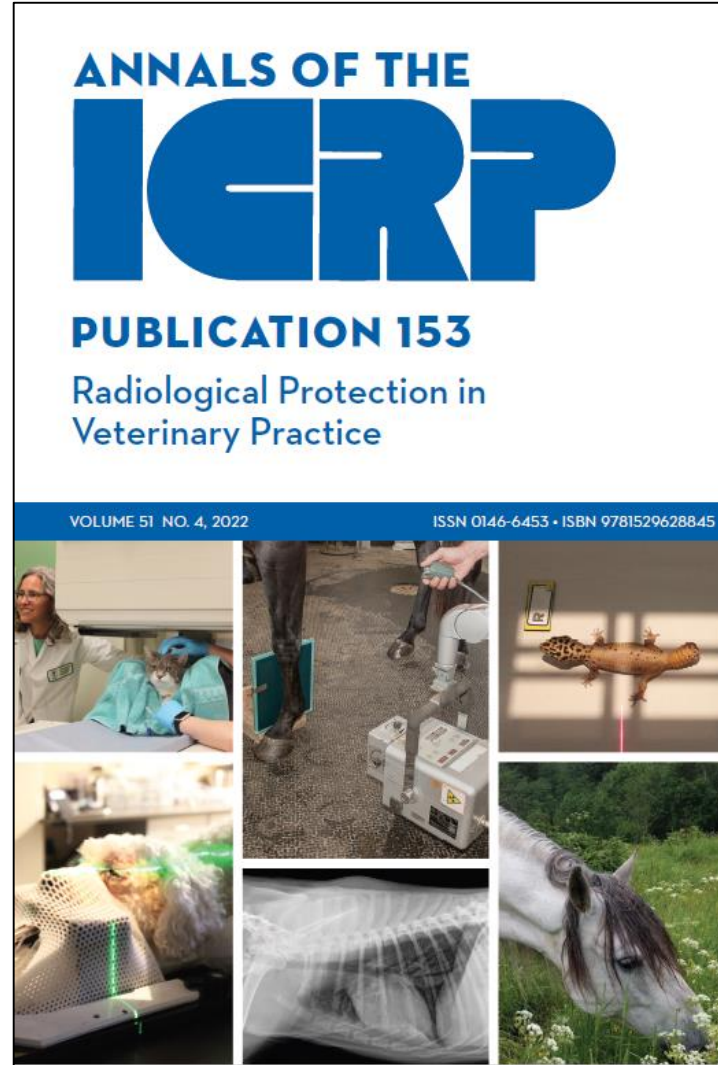
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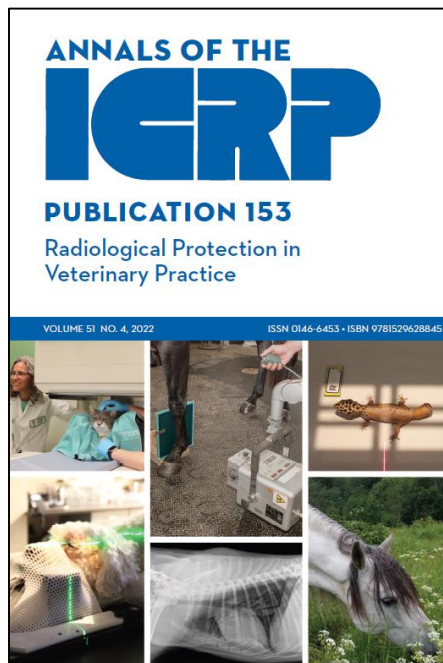


# Publication 153 - Radiological Protection in Veterinary Practice

C3/C4 co-chairs  
Aste Sovik and Nicole Martinez



# Publication 153 - Radiological Protection in Veterinary Practice



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# Active task groups under C3

## Task Group 36

Radiation Dose to Patients in Diagnostic Nuclear Medicine

## Task Group 108

Optimisation of Radiological Protection in Digital Radiography, Fluoroscopy, and CT in Medical Imaging

## Task Group 109

Ethics in Radiological Protection for Medical Diagnosis and Treatment

## Task Group 111

Factors Governing the Individual Response of Humans to Ionising Radiation

## Task Group 113

Reference Organ and Effective Dose Coefficients for Common Diagnostic X-ray Imaging Examinations

## Task Group 116

Radiological Protection Aspects of Imaging in Radiotherapy

## Task Group 117

Radiological Protection in PET and PET/CT

## Task Group 126

Radiological Protection in Human Biomedical Research

## Task Group 128

Individualisation and Stratification in Radiological Protection: Implications and Areas of Application

[https://www.icrp.org/icrp\\_group.asp?id=9](https://www.icrp.org/icrp_group.asp?id=9)

# TG 36 Radiation Dose to Patients in Diagnostic Nuclear Medicine

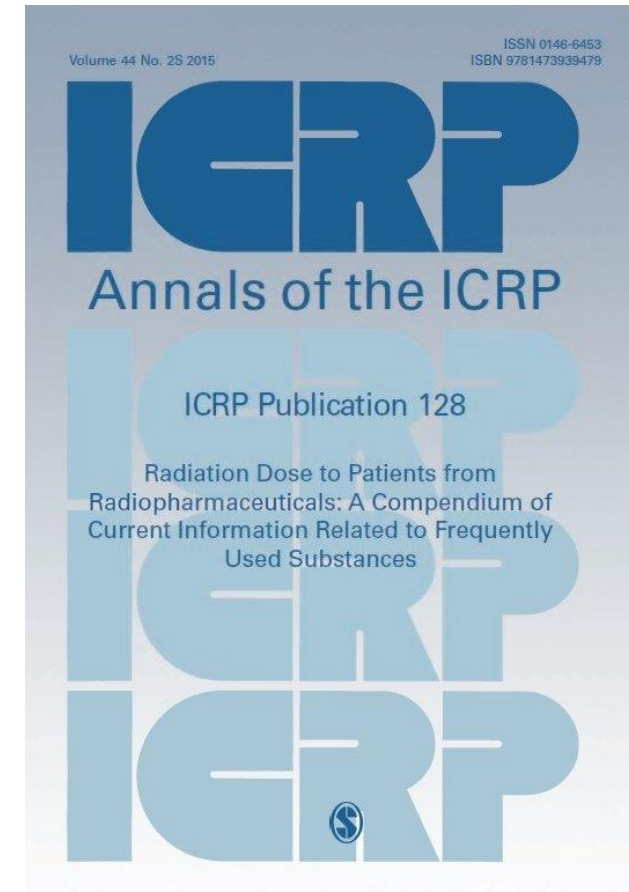
## A Task Group under Committee 2 and Committee 3

Chair : Augusto Guisani (BfS) – C2

Objective : to develop **dose coefficients for radiopharmaceuticals** administered to patients in diagnostic nuclear medicine.

Main work :

- to update **Publication 128 (2015)**
- by values calculated using **new ICRP adult and paediatric** reference voxel **phantoms**, Publication **107** nuclear decay data and Publication **103** dosimetry methodology, as well as to develop biokinetic models for **new substances** and to identify substances contained in Publication 128 where **model improvements** are needed.
- Collaboration with Eurados



# TG 36 Radiation Dose to Patients in Diagnostic Nuclear Medicine



A free and **noncommercial mobile app** has been developed (2022)

Provides **effective dose and organ doses** values for intakes of radionuclides for :

- occupationally exposed individuals,
- members of the public and
- for patients in diagnostic

The image displays three overlapping screenshots of the ICRP Dose viewer app interface. The top screenshot shows the main menu with a list of radionuclides: C Carbon, Cr Chromium, F Fluorine, Ga Gallium, H Hydrogen, I Iodine, In Indium, O Oxygen, Rb Rubidium, and Se Selenium. The middle screenshot shows the input screen for 'Administration to patients in diagnostic medicine', where the user has selected 'F Fluorine' as the element and '18-F FDG' as the radiopharmaceutical. The age is set to 'Adult', and the dose coefficient is 0.0190 mSv/MBq. The administration amount is set to 200 MBq. The effective dose is calculated as 3.80 mSv. The bottom screenshot shows a table of organ doses for the target organ 'Brain'.

Target organ	Absorbed dose (mGy)
Adrenals	2.40
Bone surfaces	2.20
Brain	7.60
Breast	1.76
Gallbladder wall	2.60
Stomach wall	2.20
Small intestine wall	2.40
Colon wall	2.60
Upper large intestine wall	2.40
Lower large intestine wall	2.80



# TG 108 Optimisation of Radiological Protection in Digital Radiography, Fluoroscopy, and CT in Medical Imaging

Chair Colin Martin (C3)

Topic divided in 2 reports :

- « Optimisation of Radiological Protection in Digital Radiology Techniques for Medical Imaging » : ***Part 1 in press, it will be publication 154***
- « Practical Aspects in Optimisation of Radiological Protection in Digital Radiography, Fluoroscopy, and CT » : ***public consultation closed + digital workshop (March 2023), plan vote by Main Commission in March 2024 for publication***



# TG 108 - Part 1: Optimisation of Radiological Protection in Digital Radiology Techniques for Medical Imaging»

*Part 1 in press*

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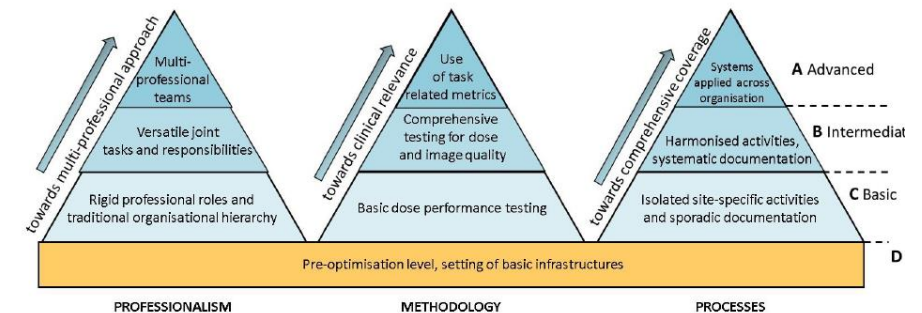


Fig. 3.1. The three main components in the development and maturation of optimisation. T

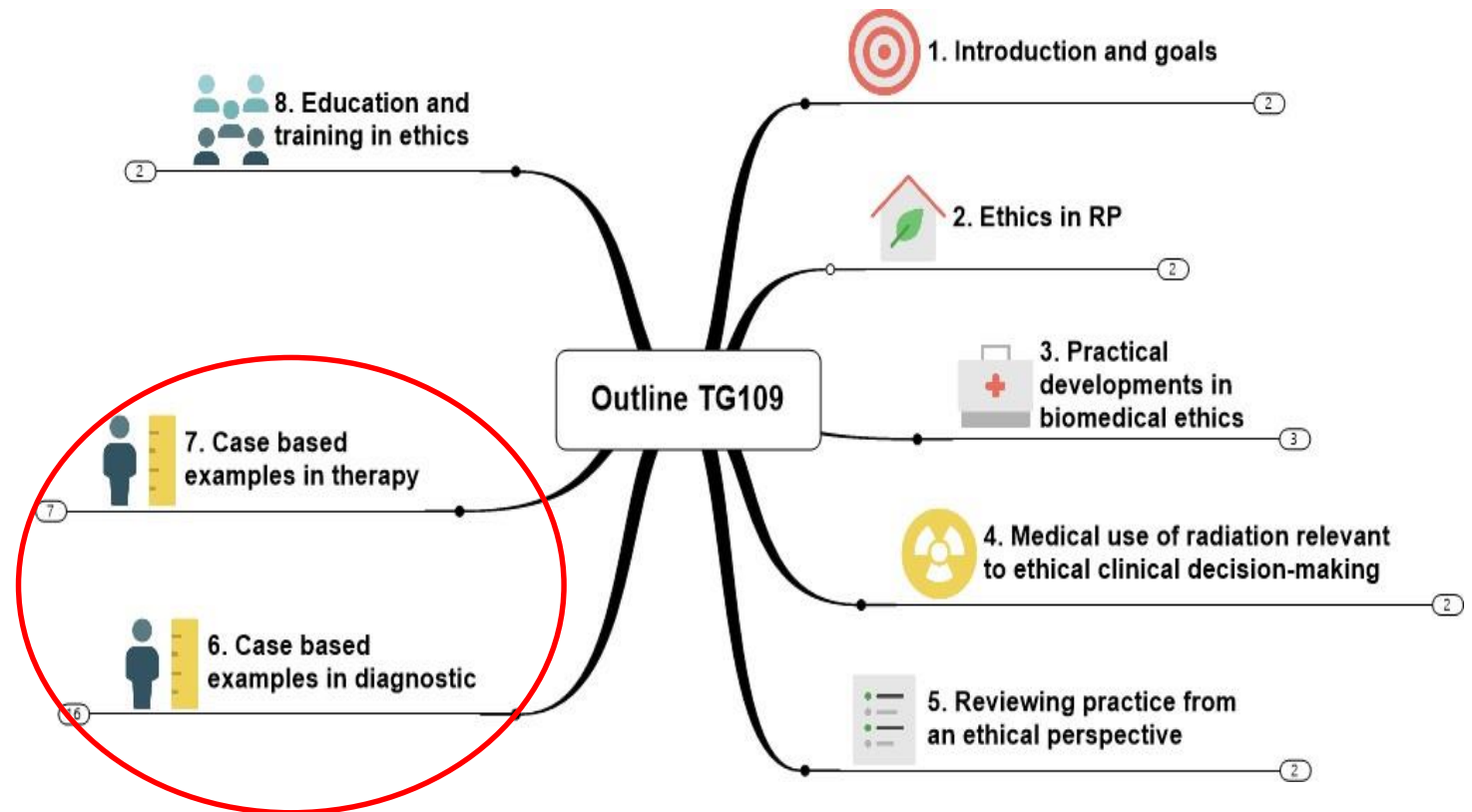
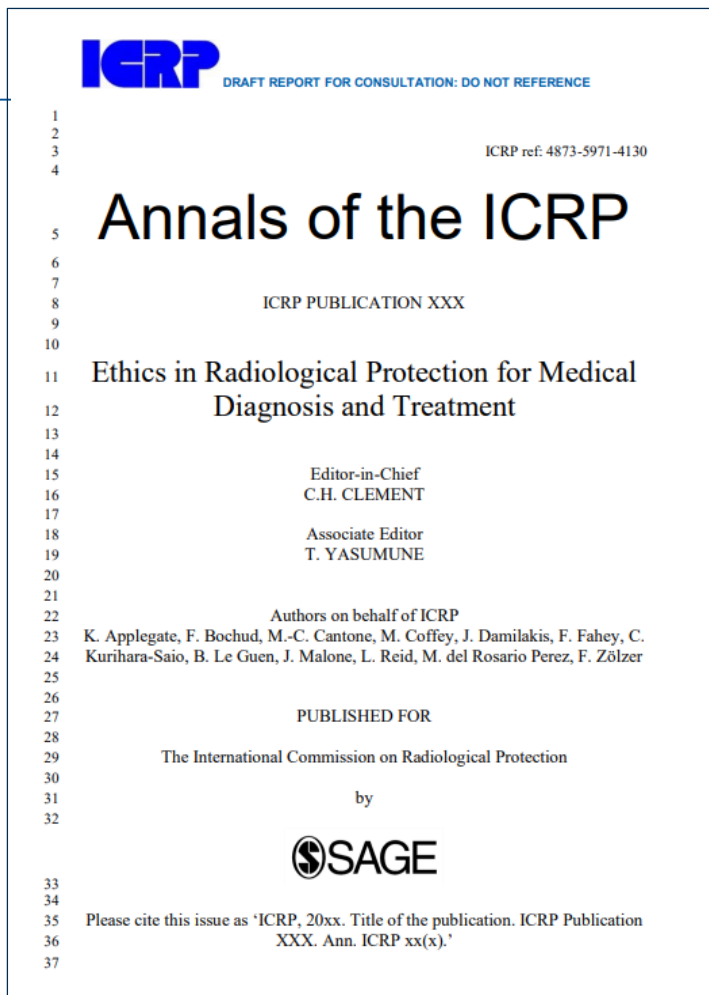
# TG 109 report - Ethics in Radiological Protection for Medical Diagnosis and Treatment

C3/C4. Co-chairs Marie-Claire Cantone and Francois Bochud.

- Webinar on 2 June 2023
- Public consultation - closed in August 2023
- Comments taken into account
- **Approved for publication**



# TG 109 report - Ethics in Radiological Protection for Medical Patient Diagnosis and Treatment



# TG 113 : Reference Organ and Effective Dose Coefficients for Common Diagnostic X-ray Imaging Examinations

## A Task Group under Committee 2 and Committee 3

Chair : C2/C3 Nina Petoussi and David Sutton

In addition to TG 36 (NM)

3 major tasks :

- **to define reference imaging exams** for the ICRP reference individuals, male and female, newborn, 1-year-old, 5-year-old, 10-year-old, 15-year-old, and adult, for **radiography** (both DR and CR), **diagnostic fluoroscopy, interventional fluoroscopy, and computed tomography**.
- to **perform Monte Carlo radiation transport simulations** for the reference imaging exams and to report **organ absorbed dose and effective dose coefficients** for each of the reference computational phantoms and for each of the relevant reference imaging exam
- proposed **to compute and compare organ doses** in the 10<sup>th</sup> and 90<sup>th</sup> body height / weight percentiles for patient populations with the values obtained for the reference individuals under Task B.

# TG 116 : Radiological Protection Aspects of Imaging in Radiotherapy



Chair, Colin Martin.  
Vice chair, William Small.

First full draft of the report being finalized

Mentee project ongoing to develop **methods of dosimetry for CBCT** in RT - now includes 22 **countries** (Australia, Belarus, Brazil, Canada, China, Colombia, Cyprus, Hong Kong, India, Iraq, Malaysia, Oman, Poland, Portugal, Saudi Arabia, Serbia, South Africa, Spain, Sweden, UAE, UK, USA)

Table of the current report (working document)

1. INTRODUCTION
2. RADIOTHERAPY TREATMENT PLANNING AND DELIVERY
3. IMAGING REQUIREMENTS FROM A CLINICAL PERSPECTIVE
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12. EDUCATION AND ONGOING TRAINING OF RADIOTHERAPY STAFF

# TG 117 - Radiological Protection in PET and PET/CT

C3 Chair, Josep Marti-Climent

## Current Consultations

ICRP routinely solicits comments on most draft documents prior to publication, with the exception of those that are basically as specific absorbed fraction values or dose conversion factors.

2023-08-11

### Radiological Protection in PET and PET/CT

 Draft Document

Submit your comment before: December 29, 2023

[Submit comment](#)

[Comments](#)

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# TG 117 - Radiological Protection in PET and PET/CT



DRAFT REPORT FOR CONSULTATION: DO NOT REFERENCE

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# TG 126 - Radiological Protection in Human Biomedical Research

C3 - Isabelle Thierry-Chef, Chair & Hanne Waltenburg, co-Chair

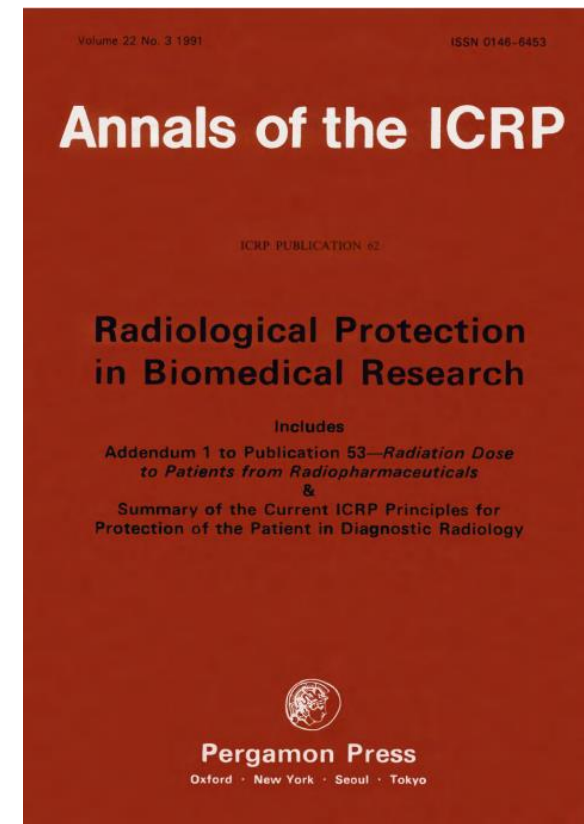
Revision of ICRP Report 62 on Biomedical Research (1991) with objective to update recommendations regarding the use of ionising radiation **in human biomedical** research.

Scope limited to human subjects deliberately or accidentally exposed to IR.

> [J Radiol Prot. 2023 Nov 10;43\(4\). doi: 10.1088/1361-6498/ad04f0.](#)

**Radiological protection in human research ethics using a case study: toward update of the ICRP Publication 62**

Chieko Kurihara <sup>1</sup>, Kimberly E Applegate <sup>2</sup>, Jee Hyang Jeong <sup>3</sup>, Keiichi Akahane <sup>4</sup>,  
Keon Wook Kang <sup>5</sup>



# TG 128 - Individualisation/Stratification in Radiological Protection – Implications and Areas of Application

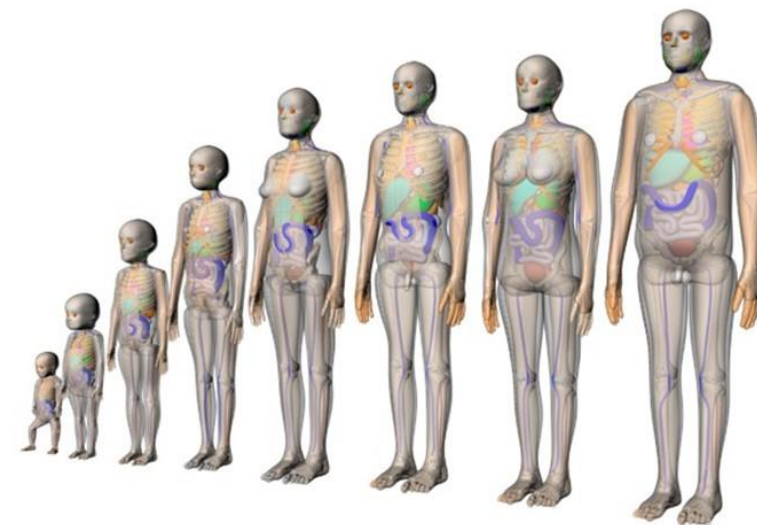


Chair Simon Bouffler for C1, C2, C3, and C4

**Objective :** Consider whether and for which situations the system of protection should adopt a more individualised/stratified approach, particularly when considering low dose, low dose-rate and chronic exposures

## Background

- Medicine is adopting a personalised approach through genetics
- **There is an interest within the imaging community in having better indicators of risk from procedures for individual patients\***
- Recent developments in dosimetry with libraries of phantoms that encompass age, sex, height, weight and posture make more precise organ/tissue-specific doses feasible
- A review of the method of calculation of the radiation-related detriment has been performed recently



\*note for example: Bosch de Basea Gomez, M., Thierry-Chef, I., Harbron, R. *et al.* Risk of hematological malignancies from CT radiation exposure in children, adolescents and young adults. *Nat Med* (2023). <https://doi.org/10.1038/s41591-023-02620-0>

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**THANK YOU!**

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