ICRU – 20130409

CONTACT:
Patricia Russell
(*Executive Secretary*)
Laura Atwell
(*Assistant Executive Secretary*)

International Commission on Radiation Units and Measurements

7910 Woodmont Avenue, Suite 400, Bethesda, MD 20814-3095, USA
Tel: +1-301-657 2652 • Fax: +1-301-907 8768
Web: www.icru.org • Email: icru@icru.org

HISTORY

The ICRU (originally known as the International X-Ray Unit Committee and later as the International Committee on Radiological Units) was conceived at the First International Congress of Radiology (ICR) in London in 1925 and officially came into being at ICR-2 in Stockholm in 1928. The primary objective was to propose an internationally agreed-upon unit for measurement of radiation as applied to medicine. From 1950 the ICRU expanded its role significantly to embrace a wider field. Initially meetings were held every 3 years at ICR congresses (excluding the 13-year period that encompassed World War II) with every participating country having the right of attendance (one physicist and one radiologist from each).

The Chairmen of these initial ICRU meetings were nominated by the ICR host country. Continuity was provided by L S Taylor (USA) who served as a member [1928 – 1934], Secretary [1934 – 1953], first permanent Chairman [1953 – 1969] and then Honorary Chairman [1969 until his death in 2004]. Subsequent ICRU Chairmen have been: H O Wyckoff (USA) [1969 – 1987]; A Allisy (France) [1987 – 1994]; A Wambersie (Belgium) [1994 – 2006]; and P M DeLuca, Jr (USA) [2006 – 2009]. H-G Menzel (Switzerland) is current Chairman.

OBJECTIVES

The ICRU has as its principal objective the development of internationally accepted recommendations regarding:

(1) quantities and units of radiation and radioactivity;
(2) procedures suitable for the measurement and application of these quantities in diagnostic radiology, radiation therapy, radiation biology, nuclear medicine, radiation protection, and industrial and environmental activities;
(3) physical data needed in the application of these procedures, the use of which assures uniformity in reporting.

The ICRU endeavours to collect and evaluate the latest data and information pertinent to the problems of radiation measurement, and to recommend in its publications the most appropriate values of radiation quantities and the most appropriate and safest techniques for current use.

The Commission maintains close contacts with the US National Council on Radiation Protection (NCRP) as well as with other international organizations including the International Atomic Energy Agency (IAEA), World Health Organization (WHO), the International Commission on Radiological Protection (ICRP), the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), the International Organization for Standardization (ISO), the International Bureau of Weights and Measures/*Bureau International des Poids et Mesures* (BIPM) and the International Committee for Weights and Measures/*Comité International des Poids et Mesures* (CIPM).

Many organizations and institutes, radiation workers, patients (particularly those with cancer) and indeed the public benefit directly from the activities of the ICRU.

GRAY MEDAL

The prestigious Gray Medal was established by the ICRU in 1967. The medal is awarded for outstanding contributions to scientific fields of interest to the ICRU and honors the late Louis Harold Gray, former member and Vice Chairman of the ICRU and eminent medical physicist and radiobiologist. The medal is awarded with a frequency determined by the ICRU and is usually awarded, in rotation, to recipients in the fields of Radiation Oncology, Medical Imaging and Basic Radiation Science. The medal is presented at an appropriate international event where the recipient is invited to give a scientific lecture.

RECIPIENTS

1969 L V Spencer (Radiation Physics)
1975 J W Boag (Radiation Physics)
1977 M M Elkind (Radiobiology)
1981 M Tubiana (Radiation Oncology)
1985 H H Rossi (Radiation Physics)
1989 D Schulte-Frohlinde (Radiation Chemistry)
1995 H R Withers (Radiobiology)
1999 P Lauterbur (Medical Imaging)
2001 H D Suit (Radiation Oncology)
2003 R M Fry (Radiobiology)
2003 M J Berger (Radiation Physics)
2005 C E Metz (Medical Imagng)
2007 E J Hall (Radiation Oncology)
2009 A van der Kogel (Radiobiology)
2011 D T Goodhead (Rad. Science)

ICRU members at the Annual Meeting in Oxford, UK, 24 – 28 March 2013

MEMBERSHIP

Since the sixth meeting in 1950 members have been elected to the ICRU by incumbent commissioners. The Commission is composed of a maximum of 15 members selected for their scientific ability and is widely regarded as the foremost panel of experts in radiation medicine and in the other fields of ICRU endeavor. There is currently one vacancy. Meetings are held annually.

CURRENT MEMBERS

H-G Menzel (Switzerland), *Chairman*
P M DeLuca, Jr (USA) *Vice-Chairman*
D T L Jones (South Africa), *Secretary*
S M Bentzen (USA), *Executive Director*
J M Boone (USA), *Executive Director*
A Wambersie (Belgium), *Consultant to Board*
G F Whitmore (Canada), *Consultant to Board*
D Burns (France)
P Dawson (UK)
E Fantuzzi (Italy)
R A Gahbauer (USA)
V Grégoire (Belgium)
H G Paretzke (Germany)
H Tatsuzaki (Japan)

FUNDING

Income is currently derived mainly from the sale of ICRU Reports. Financial support is provided by the International Atomic Energy Agency and there are also contributions from national and international organisations and professional societies, as well as commercial companies. Indirect monetary support is provided by organizations which host meetings and subsidize personnel who are members of ICRU (salaries and travel expenses) to participate in ICRU activities. All Commissioners, Report Committee members and consultants serve without compensation. Funds are expended for administrative purposes, to maintain a part-time secretariat and to provide reimbursement for travel expenses.

REPORT COMMITTEES

The Commission is assisted at any given time by several Report Committees, composed of expert voluntary members who are selected to produce reports on specific topical subjects. Voluntary consultants with specialized knowledge of particular issues are often appointed to assist the Report Committees. These ICRU reports are the premier international authoritative reference sources for medical radiation procedures and for specifications and standards in industrial, environmental and other applications of radiation and in radiation protection.

Two reports per year are published as the *Journal of the ICRU* by Oxford University Press. ICRU recommendations are often adopted by governments, national statutory bodies and international associations and organizations

ICRU REPORTS

(www.jicru.oxfordjournals.org)

RECENTLY PUBLISHED REPORTS

78 Prescribing, Recording, and Reporting Proton-Beam Therapy (2007) [with IAEA]
79 Receiver Operator Characteristic (ROC) Analysis in Medical Imaging (2008)
80 Dosimetry Systems for Use in Radiation Processing (2008)
81 Quantitative Aspects of Bone Densitometry (2009)
82 Mammography: Assessment of Image Quality (2009)
ICRP 110 Adult Reference Computational Phantoms (2009) [with ICRP]
83 Prescribing, Recording, and Reporting Photon-Beam Intensity-Modulated Radiation Therapy (IMRT) (2010)
84 Reference Data for the Validation of Doses from Cosmic Radiation Exposure of Aircraft Crew (2010) [with ICRP]
ICRP 116 Dose Conversion Coefficients for Radiological Protection Quantities for External Radiation Exposures (2010) [with ICRP]
85a Fundamental Quantities and Units (2011)
86 Quantification and Reporting of Low-Dose and other Heterogeneous Exposures (2011)

REPORTS IN PREPARATION

- Image Quality and Patient Dose in Computed Tomography
- Prescribing, Recording, and Reporting Brachytherapy for Cancer of the Cervix
- Key Data for Measurement Standards in the Dosimetry of Ionizing Radiation
- Prescribing, Recording, and Reporting Ion-Beam Therapy
- Prescribing, Recording, and Reporting Stereotactic Treatments with Small Photon Beams
- Bioeffect Modeling and Equieffective Dose Concepts in Radiation Therapy
- Operational Radiation Protection Quantities for External Radiation
- Measurement and Reporting of Radon Exposures
- Practical Radiological Protection Recommendations on Mitigating Secondary Cancer Risks in Modern Radiation Oncology [with ICRP]

OXFORD UNIVERSITY PRESS

EVOLUTION OF RADIATION UNITS (ICRU RECOMMENDATIONS)

QUANTITY		UNIT			DATE
Name	**Symbol**	**Unit**	**Special name**	**Symbol**	
Exposure	X	1 e.s.u. / 0.001293 g of air	röntgen	r→R	1928
Absorbed dose	D	erg g^{-1}			1950
Activity	A	3.7×10^{10} s^{-1}	curie	c	1953
Absorbed dose	D	100 erg g^{-1}	rad	rad	1953
Fluence	Φ	cm^{-2} / m^{-2}	(reciprocal area)		1962
Dose equivalent	H	100 erg g^{-1}	röntgen equivalent man	rem	1971
Absorbed dose	D	J kg^{-1}	gray	Gy	1974
Activity	A	s^{-1}	bequerel	Bq	1974
Dose equivalent	H	J kg^{-1}	sievert	Sv	1977

D T L Jones: 09 April 2013