



Summary of the 6th International Symposium of ICRP – Vancouver (Canada) – 7-10 Nov 2022

*19th meeting of the European IRPA Associate Societies
October 25, 2021*

- 4 days, 15 sessions, 3 keynote lectures, ≈ 500 participants (400 in person) from 61 countries
- Jointly with the annual CRPA/ACRP meeting
- Bo Lindell lecture 2021: Haruyuki Ogino (Jap, NRA)
- Context:
 - Review and revision of the ICRP System
 - Conflict in Ukraine: Pub 146 free, advice for the public protection in case of a nuclear detonation

- UNSCEAR: 2020-21 report
 - No real need to change the approach for low doses
- OECD: Radiological and chemical adverse outcome pathways
- Epidemiology:
 - Current findings broadly reassuring
 - Circular diseases to be more investigated
- Individual response (ICRP TG111)
 - Level of risk depending on genetic and lifestyle
 - Need to consider age and sex, and smoking status
- Stem cells competition in the dose rate effects (Jap)



- Classification of harmful effects (TG123)
 - Stochastics vs tissue reactions (3rd category between?)
 - Link with TG115, TG119, TG121, TG122, UNSCEAR
- Evolution of detriment: ICRP 152
 - Improvement in quality of estimate (DDREF, models, heritable, non-cancer)
 - Handling of variation (lung, breast and other cancers; ≠ for age, sex, lifestyle, medical background, medical resources)
 - Transparency (sources, procedures, cross-validation)
 - Communication (expression of detriment, key components, calculation process uncertainties)
- Discussion about LNT

- ICRU Report 95: New operational quantities for external radiation exposure
- The operational quantity for eye lens neutron dosimetry considering ICRU 95 report (Can)
- ICRP TG103: Adult and paediatric mesh-type ICRP reference computational phantoms
 - Library of male & female phantoms for \neq ages, weights and postures
- Ultra-high dose-rate (FLASH) dosimetry in radiation therapy (CH)
 - Not yet for clinical routine
- Case-study of co-exposure IR + heavy metals (Can)

- ICRP TG97: RP in (near) surface disposal of solid waste
 - Soon in public consultation
- Refurbishment project of a 4 units CANDU (Can)
- Project on large volume sorting, segregation and source term characterisation of low level waste from CANDU NPPs (Can)
- RP strategy in high grade underground U mines (Can)
- New designs: Advanced reactors, SMR (CAN)
- Nuclear Industry Experiences in Radiation Exposures (UK)
- Virtual reality technology (China) and AI (USA)
 - Issue of RP in new technologies (AI, SMR, fusion...)
- Implementation of a new equivalent dose limit for the lens of the eye in Canada

- IRPA TG on public understanding of the radiological risk
 - How to engage public and communicate with it ?
- Inadvertent intrusion in a waste disposal site (Can)
 - High risk / low probability
- Role of a NGO: Nuclear Transparency Watch (NTW, Fr)
 - Campaigns, dialogues, round tables, serious games, participation in research programmes...
- Well-being, holistic approach

- ICRP TG108a: Optimisation of imaging
 - Multi-professional approach, clinical relevance, comprehensive coverage
- ICRP TG116: RP aspects of imaging in radiotherapy
 - Optimisation could be improved while not easy
- Communication with patients on radiological procedures (S Korea)
- The role of AI/ML in radiotherapy TPS (USA)
 - Pediatric therapy
- Radiation Safety Program for Hybrid Modalities (Can)
 - MIR combined with PET-Scan
- Exposure of volunteers in medical research (SW)
 - Challenges for justification and optimisation
 - Children, pregnancy, age and gender, health issues

- ICRP TG110:
 - Protection of personnel and members of the public (e.g. owners) (human = priority)
 - Protection of animals (explicit attention)
- Investigation of practices in USA
 - Need to provide an ethical framework, to improve optimisation

- A few presentations, no deep discussion
 - Reference to ICRP Pub 142
 - Still many challenges:
 - Demonstrate the protection of the public and the environment
 - Engage the industry (e.g. decommissioning in Canada)
 - Communicating the risk (cf. IRPA TG): listen to the voice of practitioners
 - ...

- ICRP: Pub 108 + TG99, TG105, TG125, TG114
 - Enhance the strength of evidence of the protection of environment
 - Making the best use of existing data and managing uncertainties
 - Using the Adverse Outcome Pathway (AOP) concept
- ICRP TG118: RBE for reference animals and plants
 - Cf. ICRP 148: RBE for dose rate > DCRL
 - Other RBE, quality factor Q, radiation weighting factors
 - Data for high Let is lacking
 - RBE for animal < RBE for plants
- ICRP TG125: Ecosystem services in environmental RP
 - Ecosystems created and managed by people for the purpose of delivering social and cultural values

- Ethical foundations of the RP System (ICRP 138)
 - Core values + Procedural values
 - 1 of the building blocks
- Ethical dimension of Tolerability and Reasonableness (TG114)
 - Work on-going (cf. workshops)
- Ethical aspects in the use of radiation in medicine (TG109)
 - Bridge between medical ethics (ancient) and RP ethics (recent)
 - Soon in public consultation
- Ethics of (radiological) protection of the environment
 - 1st reflections
- Applying a public health ethics framework to RP
 - Thoughts about equality vs equity, Mill's harm principle (do what you want except causing harm to others)...

- ICRP 146
 - Contribution of the Dialogues in Fukushima to building ICRP 146
 - Recommendations on workers and responders
- OECD/NEA: guidance for preparedness
- Health literacy in the field after Fukushima (Jap)
 - Mother's concerns, measurements, schools, training of nurses, facilitators, take account of both professionals and resident skills
- Overview of secondary health issues after Fukushima accident
 - Diabetes
- Impact of decontamination of farmlands and forest (Jap)
- Lessons from COVID 19 (Can)
 - Adapting to prevailing circumstances
- Optimisation through resilience (Can)
- Radiological training for the defence science (Can)
- Situation of the Fukushima Daïchi NPP 11 years after

- Mentoring:
 - Exists within CIPR, to be developed in companies
 - Some experiences of mentees
 - Testimonies about difficulties as student or young professional
- IRPA Young Generation Network (YGN)
- Canadian student paper contest
- Cousin award for young scientists and professionals
 - Winner: Luana Hafner (CH)



- Launched in 2021
 - Keeping the ICRP Recommendations fit for purpose
 - Areas of research to support the RP System
- Digital workshop in 2021 (proceeding published soon)
- Call for action to strengthen expertise
- UN sustainable development goals
- It is a joint project (many organisations participating)
- > 30 TGs on-going (\approx 20 building blocks already addressed)



Review and revision of the ICRP System

The voice of other organisations

- IRPA:
 - Specific TG
 - Workshops on Tolerability/Reasonableness
 - 4 key topics: general issues; optimisation and reasonableness; effective dose, risk estimation and ethics; exposure situations
- HERCA:
 - simplification/clarification, justification/optimisation, use of RLs, radon, medical, environment, responders, communication, education/training
- IAEA: need for stability
- SSK (D):
 - Conceptual: OK with LNT, need to review DDREF, detriment, weighting factors, practicability/realism
 - Individual: cardio, new medical procedures, ethics, dose limits, radon
- CSN (SP): need for simplification/clarification
- J. Valentin: Review of issues needing attention of Committees



- Tokyo – 7-9 Nov 2023

THANK YOU FOR YOUR ATTENTION