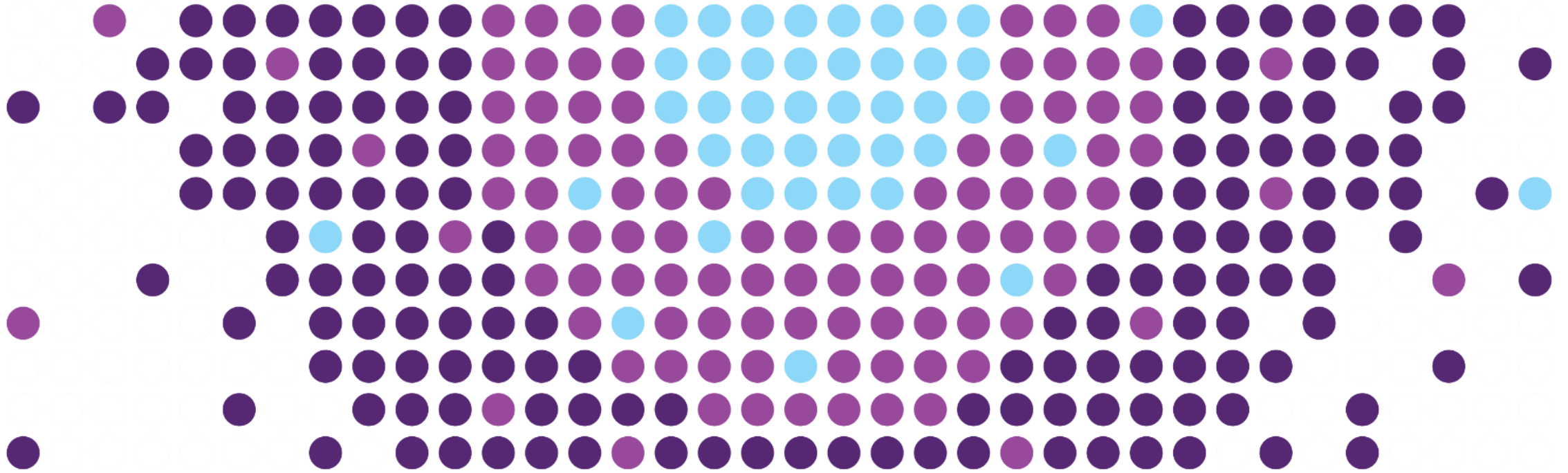




New IAEA Safety Report on Education and Training for Building and Maintaining Competence in Radiation Protection in Medicine

Global use of ionizing radiation in medicine



~ **4.2 billion** medical radiological procedures annually*



Wide range of applications: DR (incl. dentistry), FGIP (incl. cardiology, vascular surgery, urology, gastroenterology, orthopaedics, neurosurgery, etc.), RT , NM



Increasing Complexity (Advanced CT imaging, high-dose procedures in FGIP, theranostics in NM, advanced RT techniques)



Potential Radiation Risks:

Patient: Unnecessary or unintended exposures

Healthcare professional: Cumulative occupational exposures

International framework of competence in radiation protection

- IAEA GSR Part 3

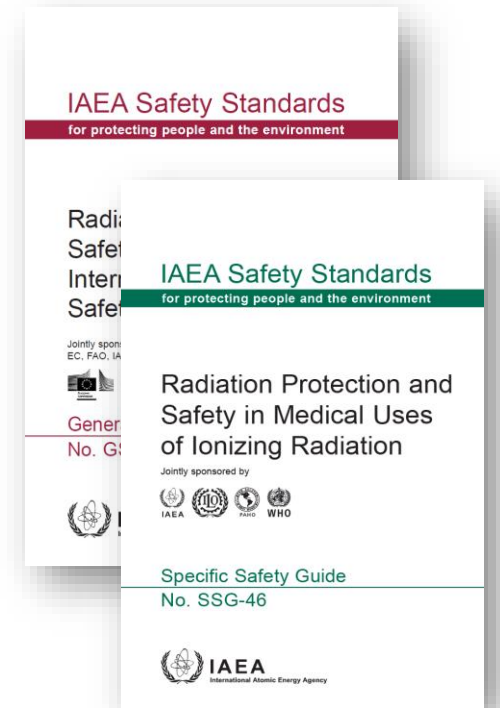
...medical exposures to be performed by personnel who

- Are **specialized*** in the appropriate area
- **Meet the respective requirements** for education, training and competences in radiation protection

- IAEA SSG 46

... RP and safety associated with the radiological procedure greatly depends on the skills and expertise of those health professionals involved...

→ **Education, training, qualification and competence of HC professionals are an essential component** of radiation protection and safety in the medical use of ionizing radiation.



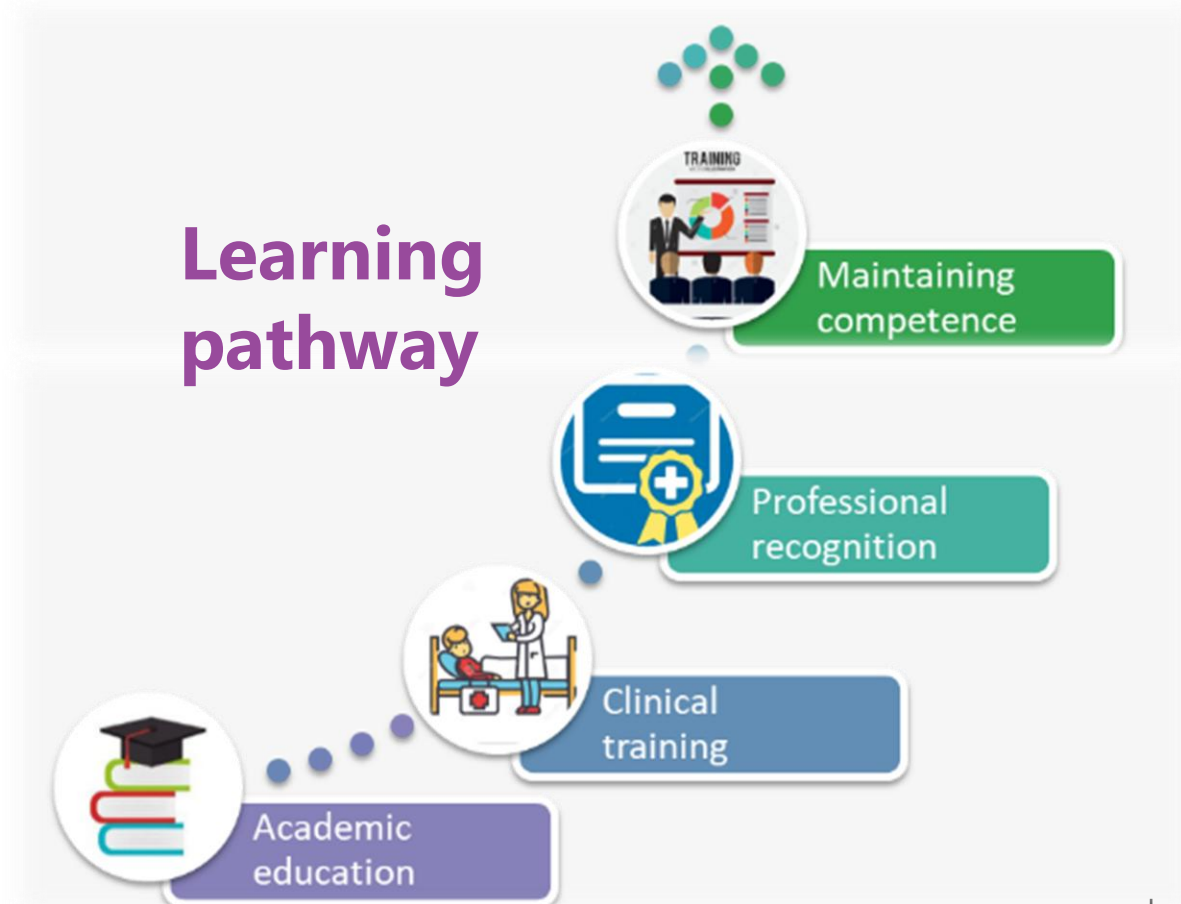
Competence in Radiation Protection

HC professionals directly involved

- Progressive learning pathway
 - (under)graduate education
 - Postgraduate training (clinical residence training)
 - CPD

Other professionals (e.g. regulators, service engineers, support staff)

- Initial education (not RP focused)
- Specific RP training
- (CPD)



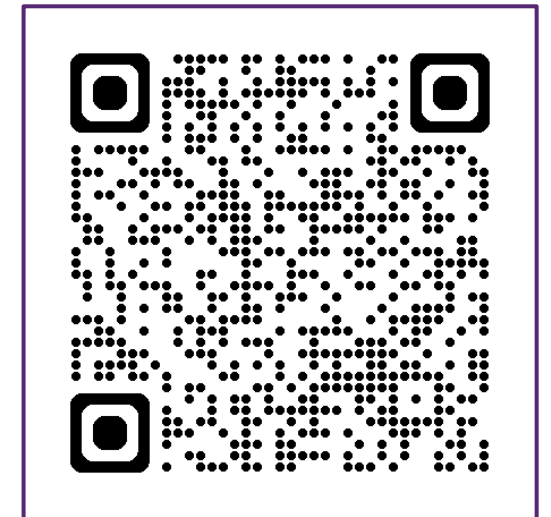
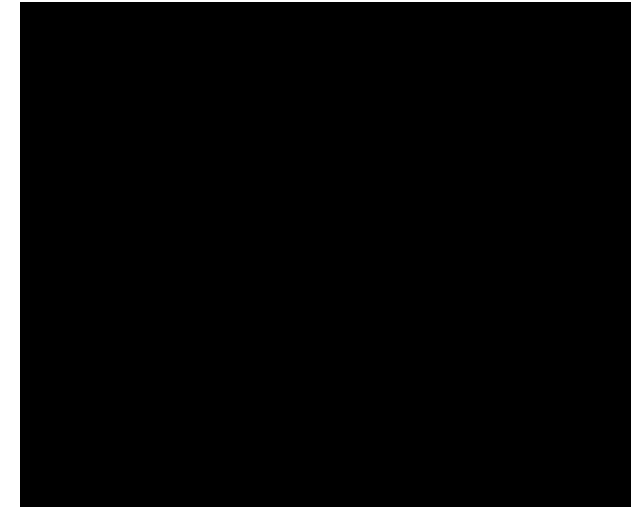
Initiation of a new Safety Report

(2021) The IAEA Technical Meeting on Developing Effective Methods for RP E&T of Health Professionals:

- Need for international **guidance on effective implementation** of RP E&T requirement in medicine
- **Request to the IAEA** to develop a dedicated publication in cooperation with international organizations and professional bodies

Objective of the Safety Report 130

- Provide international guidance on
 - qualification and **competence in RP for professionals**
 - the **practical application of a systematic approach** to E&T to build and maintain these qualifications and competence
- **Focus on practical implementation** of the requirements for E&T in RP
- Provides also practical guidance on the
 - **learning methodology** adjusted to adult learning approaches
 - **criteria for trainers and training providers**
- **Enables**
 - to develop E&T programmes in RP where none exist
 - to upgrade and benchmark existing programmes against international good practice



Target audience of the Safety Report 130

- **Authorities:** responsible for legislation and guidance on E&T in RP
- **Professional bodies:** providing guidance for professional recognition of their members
- **Education and training providers:** undergraduate, graduate, postgraduate levels, CPD
- **Licensees and registrants:** responsible for implementing the requirements in practice
- **Healthcare professionals:** seeking clarity and support for their E&T needs

Scope of the Safety Report 130

- **Radiation protection context**
 - with focus on medical exposure
 - Also including occupational and public protection relevant to the role
- **Healthcare professionals:**
 - Diagnostic radiology
 - Dental radiology
 - Nuclear medicine
 - Radiation therapy
 - Image-guided interventional procedures
 - Referring medical practitioners
- **Other professionals:**
 - Equipment suppliers and application specialists
 - Installation, maintenance, and servicing personnel
 - Regulators and inspectors
- **Out of scope**
 - MPE (other guidance available)
 - RPE & RPO (other guidance in development)

Cooperation and endorsement of the Safety Report 130

- Developed through collaboration across multiple IAEA divisions:
 - Division of Radiation, Transport and Waste Safety
 - Division of Human Health
- Sponsored by the **World Health Organization**
- Endorsed by **11 international organizations** representing health professionals



Structure of the Safety Report 130

- **Section 1 – Introduction**
- **Section 2 – Framework for E&T in RP**
 - Roles and responsibilities
 - Systematic Approach to Training (SAT)
- **Section 3 – Categories of professional needing E&T in RP**
 - Twelve categories requiring radiation protection training
- **Section 4 – Qualification and competence in RP**
 - Learning pathway
 - Building competence
 - Assessment of competence
 - Maintaining competence

Structure of the Safety Report 130

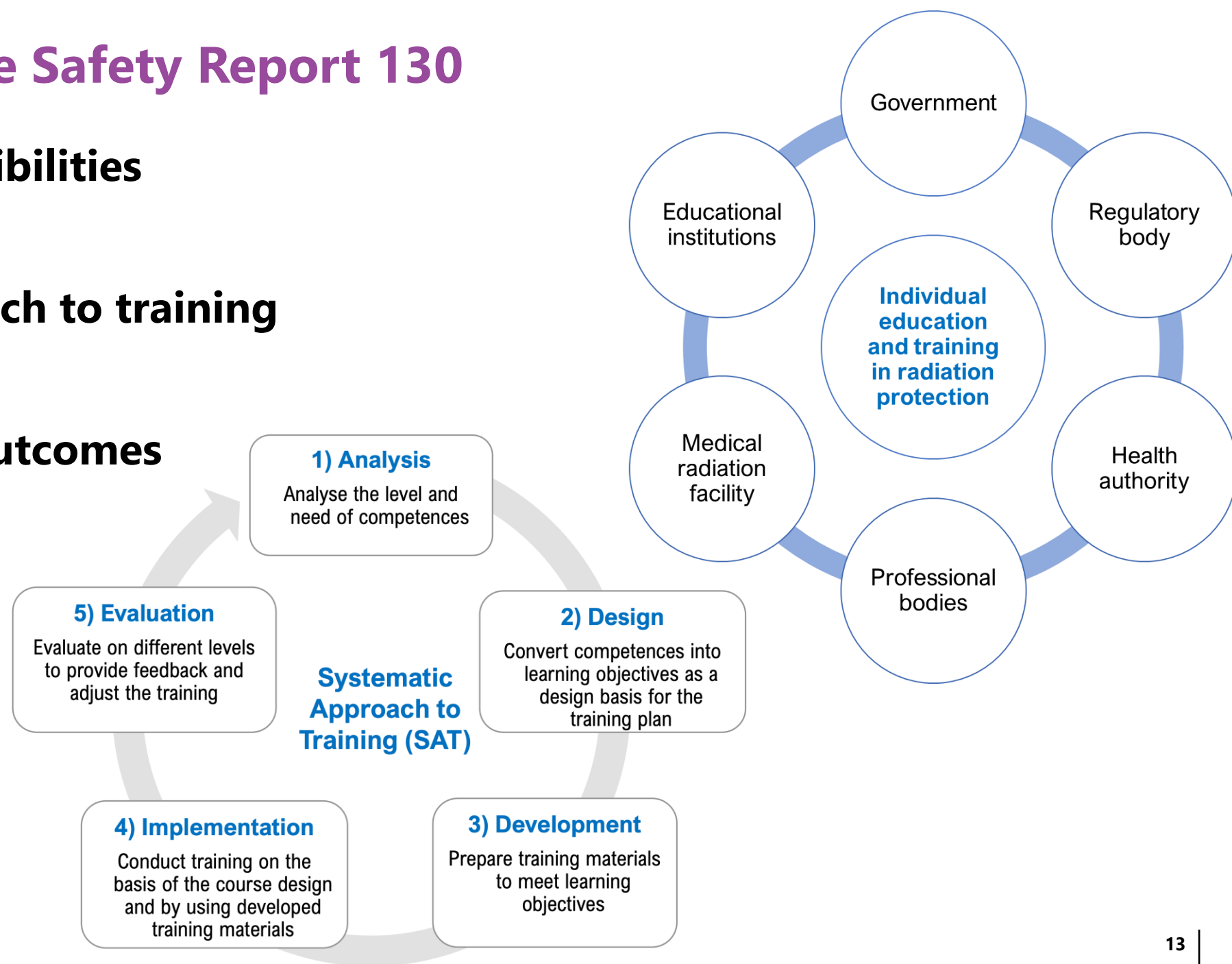
- **Section 5 - Topics and learning outcomes in RP**
 - Topics and **core learning outcomes**
 - (Reference to) **specific learning outcomes** tailored to different professional roles
- **Section 6 - Teaching and learning methodologies**
 - Teaching and learning strategy and tools
 - Teaching approaches
- **Section 7 - Quality criteria for providers of training**
 - Institution providing education and training
 - Individual educators and trainers
 - Train-the-trainer approach (graded approach)

Structure of the Safety Report 130

- **Appendix:**
 - Specific learning outcomes in RP for different groups of professional
- **Annexes:**
 - Examples of the application of a SAT
 - Summary of free IAEA training resources

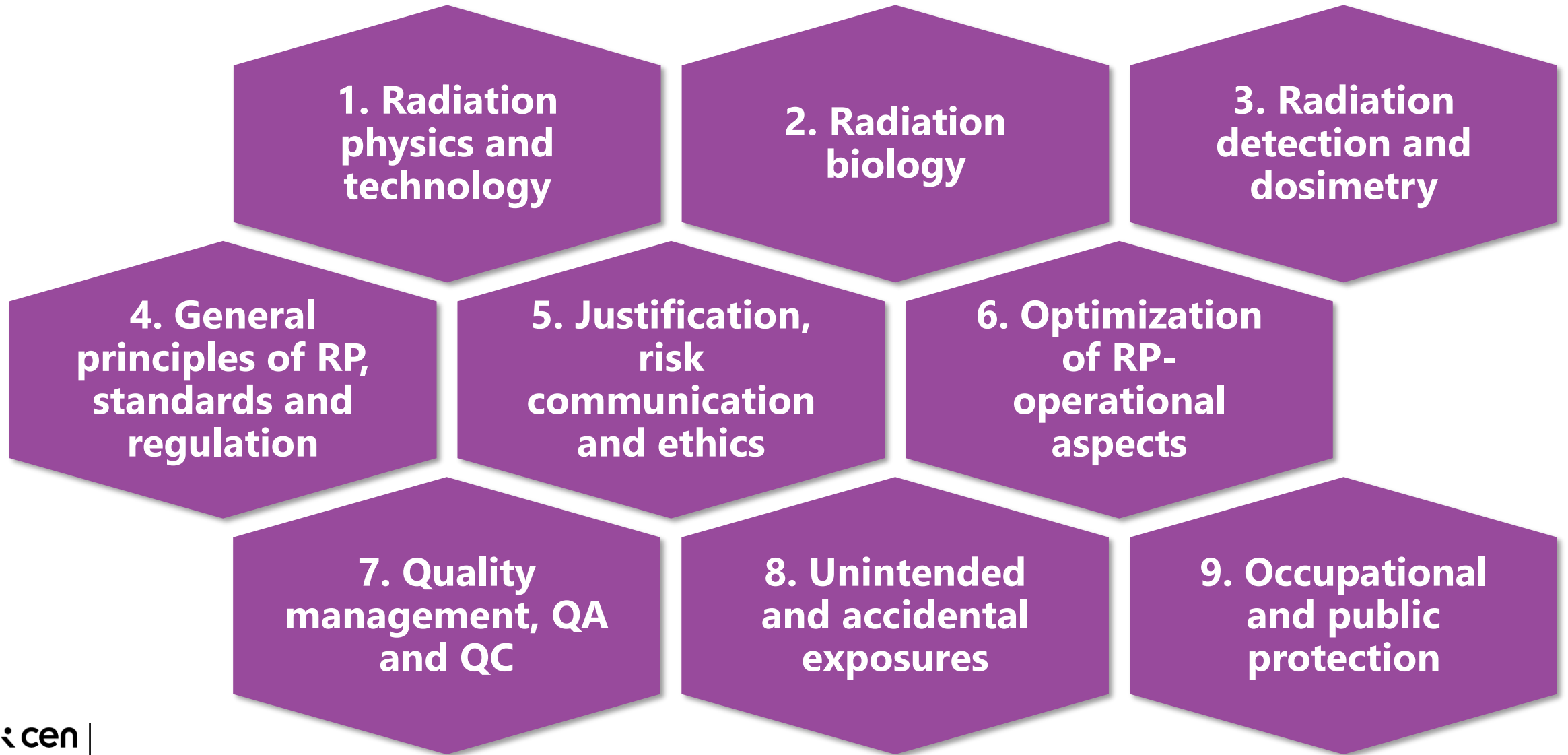
Highlights of the Safety Report 130

- **Roles and responsibilities**
- **Systematic approach to training**
- **Role of learning outcomes**



Highlights of the Safety Report 130

- **Core topics**



Highlights of the Safety Report 130

- **Core topics and expected learning outcomes** (example)



Content	Learning outcomes, expressed as knowledge (K), skills (S), competence (C) *
- The process of justification of radiological examinations	K. Describe the process of justification in medical procedures using ionizing radiation.
- Ionizing radiation benefit risk communication	K. Describe benefits and risks of common procedures involving ionizing radiation.
- Ethical aspects of radiation protection	S. Interpret radiation risks in the context of other risks in daily life. C. Reflect on one's own and patients' radiation risk perception. C. Acknowledge the ethical aspects in medical exposure.

Highlights of the Safety Report 130

- Specific* topics and expected learning outcomes (example)

Content		Learning outcomes	Radiation oncologists	Medical radiation technologist	Other personnel (e.g. oncology nurse)
Module	Topic				
Radiation physics and technology	- Radiation physics as applied to RT	K. Explain how radiation beams are produced for the most commonly used treatment units	•	•	See the Table for core learning outcomes
		K. Explain the factors affecting the percentage depth dose: Tissue Maximum Ratio, Tissue Air Ratio, Tissue Phantom Ratio	•	•	
		C. Differentiate between the physical properties and interactions of electrons, photons and protons/particles	•	•	
		C. Explain how the inverse square law is applied in specific situations such as brachytherapy or total body irradiation	•	•	
		K. Describe the design features of a radiotherapy suite	•	•	
	- RT equipment and technology	K. Define the equipment used in external beam radiotherapy including the beam generating process, the beam characteristics, the applied physics and design features	•	•	
		K. Identify the limitations of each treatment equipment	•	•	
		K. Identify the influence of beam parameters	•	•	
		K. Describe the design features of a brachytherapy suite	•	•	
		K. Describe the imaging equipment used for radiotherapy in diagnosis, simulation and treatment verification	•	•	
scl: cen		K. Define the range of accessory equipment used in radiotherapy	•	•	
		K. Define the methods of beam modification in clinical use	•	•	

Highlights of the Safety Report 130

- **Quality criteria for training providers**

Training Institutions

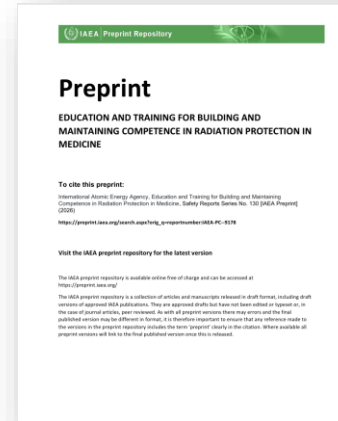
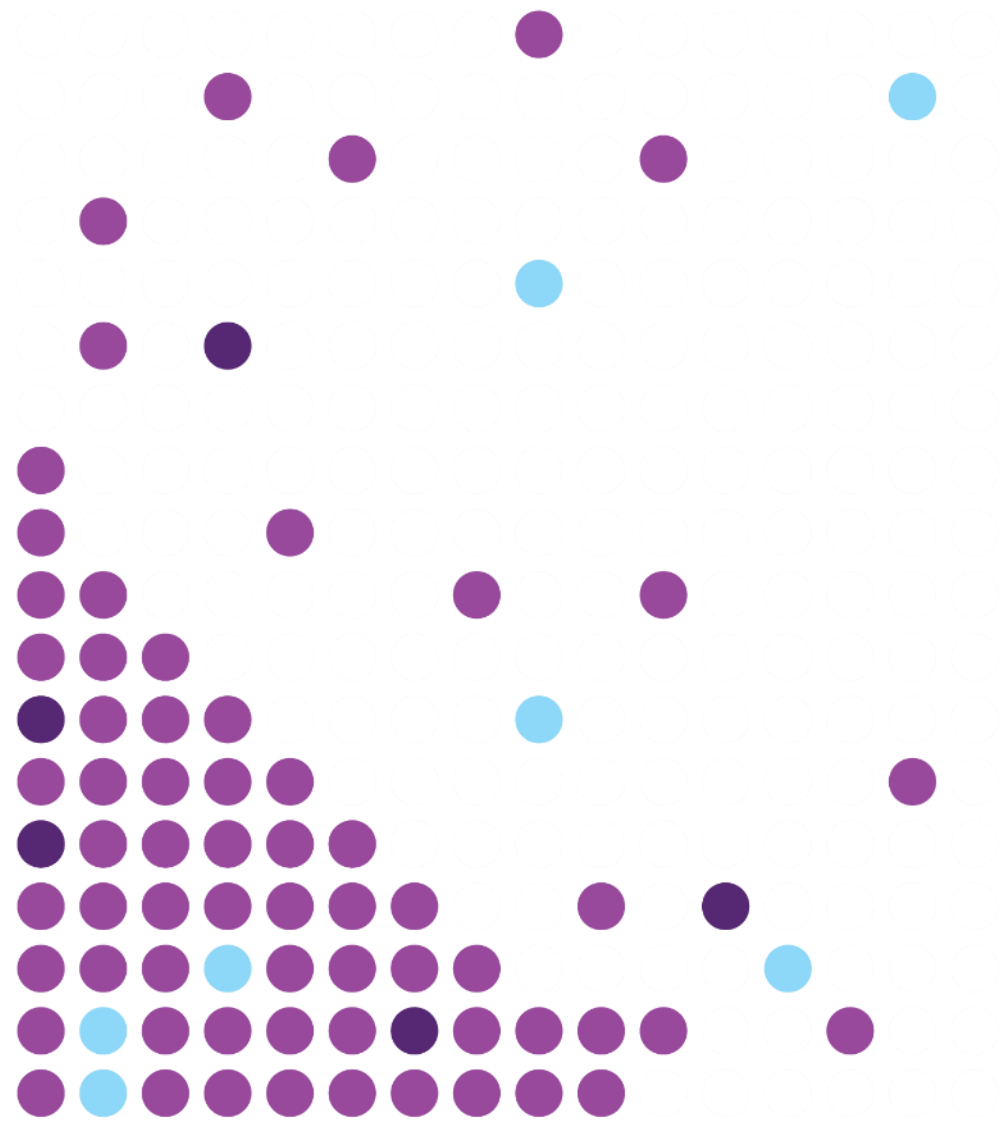
- Systematic Approach to Training
- Clear governance & roles
- Adequate resources
(staff, facilities, tools)
- Accreditation of
programmes/providers

Individual Trainer

- Clinical and subject-matter
competence
- Teaching and communication skills
- Language competences
- CPD

Why would you use the Safety Report 130 ? 😊

- **Most recent reference on competence building** in radiation protection in medical exposure
- Includes (IAEA) regulatory **requirements, roles and responsibilities** of all involved actors → widely supported by int'l organisations
- **Allows easy translation** of required competences towards learning content and learning outcomes → **practical application of SAT**
- Focuses on learning outcomes, but **goes beyond** to provide guidance on the learning pathway, teaching methodologies, maintaining competence, assessment of competence and quality criteria for training providers



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Acknowledgement to the
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