2036: Young Radiologists' Perspective

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Introduction: 2036 is not a distant future

The residents training in Belgian departments today will be the mid-career radiologists of 2036. They will lead the reading rooms, multidisciplinary meetings and AI governance boards of the next decade. For them, the future of radiology is not a forecast to watch from a distance. It is the working environment they will have to build and live in.

This lecture looks ten years ahead from the perspective of the next generation. It does not try to predict which algorithms will exist. Instead, it asks a more useful question: how will the role of the radiologist change, and what must happen now so that young radiologists are ready for it? Three shifts are already visible today.

Shift 1: from image reader to diagnostic orchestrator

Detection, segmentation, measurement and worklist triage are increasingly supported, and partly taken over, by AI. Draft reports, automated follow-up tracking and quantitative biomarkers will likely be routine long before 2036. Yet AI rarely delivers value on its own. Its benefit depends on how it is implemented and how humans work with it: the same tool can improve the performance of one radiologist and worsen that of another.

This makes the radiologist of 2036 the diagnostic orchestrator, in three roles. As **system and workflow designer**, they decide which tools enter the imaging workflow, where and in what order: triage, first reader, second reader, or autonomous handling of normal studies. As **AI governor**, they validate models locally, monitor performance and drift over time, and remain accountable for the result. As **clinical integrator**, they combine imaging and AI output with clinical history, pathology and genomics into one conclusion.

Human–AI collaboration should also be personalised. The best way of working with AI differs between clinical questions, between radiologists and between models. Collaboration strategies can be tailored to the case, to the reader and to the known strengths and weaknesses of each algorithm.

What remains distinctly human is synthesis. The radiologist judges uncertainty, decides which AI output to trust and explains findings to referring physicians and patients. Their value lies less in seeing everything and more in knowing what it means.

The key question for 2036 is not whether AI can read the image, but who takes responsibility for the conclusion.

Shift 2: from department to data-driven network

Imaging is becoming data in the broadest sense. Every scan contains information beyond the clinical question, such as body composition, bone density, coronary calcium and liver fat. This opens the door to opportunistic screening and population health. Teleradiology and cross-site networks are also loosening the link between where an image is acquired and where it is read.

The European framework is moving in the same direction. Under the European Health Data Space Regulation, most categories of electronic health data are due to become available for secondary use from 2029. The obligations of the EU AI Act for high-risk AI embedded in regulated products such as medical devices now apply from August 2028. By 2036, radiology departments will therefore work inside a regulated data ecosystem, not alongside it.

Foundation models change who can build AI. Instead of only buying generic tools trained on someone else's patients, departments can fine-tune large pre-trained models with a modest amount of their own data. This allows models for their own clinical questions, adapted to their own patient population, scanners and protocols. Hospital networks can do this together, for example through federated learning, without moving patient data, and validate the results across sites. The department of 2036 is not only a consumer of AI, but a co-developer of it.

This means the walls between disciplines, and between clinic, research and industry, will matter less. Radiologists are well placed to become the bridge between these worlds, but only if they are trained to speak their languages.

Shift 3: from one career path to many

The traditional career path ran from residency through subspecialty fellowship to a full-time clinical post. For many young radiologists this path no longer fits. They increasingly look for hybrid careers that combine clinical work with AI development and implementation, research, education, entrepreneurship or health policy. They also expect more flexibility in how and where they work.

This is not a lack of commitment to the specialty. It reflects a broader profile of radiologists who bring technical and organisational skills the profession will need. With growing imaging demand and pressure on the workforce, keeping these people in radiology matters as much as recruiting them.

The departments that offer the most diverse careers will attract the radiologists who shape the specialty.

What young radiologists need now

The future of 2036 is decided by choices made in the coming years. From the perspective of the next generation, five priorities stand out.

- **Training:** integrate AI literacy, implementation science, human–AI collaboration and the critical appraisal of algorithms into the residency curriculum, alongside clinical imaging.
- **Infrastructure:** invest in shared data platforms and hospital networks, so Belgian departments can fine-tune and validate models on their own patients and scanners.

- **Governance:** give radiologists a leading role in AI selection, local validation and monitoring, and give young radiologists a real voice in these decisions, since they will live longest with the consequences.
- **Careers:** recognise hybrid career tracks, with protected time for AI, research, innovation, education or policy work.
- **Culture:** build departments where well-being, flexibility and mentorship help retain talent in the specialty.

Conclusion

By 2036, the radiologist will be less defined by the number of images read and more by the quality of the conclusions drawn from human–AI collaboration and clinical integration. Radiologists will design, govern and orchestrate the AI systems in their departments, increasingly built on their own data. The specialty will be more data-driven, more connected and more diverse in its careers.

The young radiologists who will carry this future are already in our departments. The question for today is whether we prepare them to inherit the specialty, or invite them to help shape it.