The Future of Patient–Radiologist Interaction: From Invisible Expert to Clinical Partner

Lecture by Pr F. Budzik

Text by Chatgpt revised by Pr B. Vande Berg

For much of the history of radiology, the radiologist has occupied a paradoxical position in patient care: central to diagnosis, yet often almost invisible to the patient. Patients frequently undergo examinations that profoundly influence their diagnosis and treatment without ever meeting the physician who interprets their images. Communication traditionally occurs indirectly, through a radiology report addressed to the referring physician. This model, however, is likely to evolve substantially in the coming years. Digital access to medical information, artificial intelligence (AI), increasingly complex imaging procedures, and changing patient expectations are creating a more patient-centered form of radiology in which communication may become an increasingly important component of the radiologist's work.

From an invisible specialist to a visible physician

Many patients still have only a limited understanding of what radiologists actually do. The radiologist may be perceived as the person performing the examination, while the intellectual process of image interpretation, integration with clinical information, comparison with previous examinations, and formulation of a diagnostic conclusion is usually attributed to the referring physician.

In the future, radiologists may need to become more visible as physicians. This does not necessarily mean that every patient undergoing imaging will have a formal consultation with a radiologist. Such a model would be difficult to reconcile with current imaging volumes. Rather, direct interaction could be targeted toward situations in which it provides substantial clinical value.

Interventional radiology already provides a model for this relationship. Before and after biopsies, infiltrations, drainage procedures, vascular interventions, or tumor ablations, radiologists frequently explain indications, alternatives, risks, and expected outcomes directly to patients. Similar interactions could increasingly develop in diagnostic radiology, particularly when imaging identifies an unexpected or clinically important abnormality.

A radiologist might, for example, briefly meet a patient after an examination to explain why additional imaging is necessary, why a finding is probably benign, or why urgent medical assessment is recommended. Such encounters could reduce anxiety while reinforcing the radiologist's identity as a physician rather than simply an interpreter of images.

Patients will increasingly have direct access to radiology results

One of the strongest drivers of change is the growing ability of patients to access their own medical records and to understand them by sending it to AI. This represents an important advance in patient autonomy, but it also creates difficulties. Radiology reports have traditionally been written as communication between physicians and consequently contain specialized terminology. Expressions such as *degenerative changes*, *bone marrow edema*, *indeterminate lesion*, *cannot exclude*, or *clinical correlation recommended* have specific meanings for physicians but may be interpreted very differently by patients. A minor incidental abnormality can therefore become a major source of anxiety.

Future radiology reports may consequently develop two complementary levels of communication: a conventional professional report for clinicians and a patient-oriented summary written in understandable language. AI could assist radiologists in producing these summaries without requiring substantial additional reporting time. For example, a professional conclusion stating that there is a "small subchondral cystic lesion associated with moderate degenerative chondropathy" could be accompanied by a simpler explanation indicating that the findings are related to wear of the joint and do not suggest an aggressive bone lesion.

Artificial intelligence may increase rather than decrease communication

AI is often portrayed primarily as a technology for detecting abnormalities or accelerating image interpretation. Its influence on patient interaction may ultimately be just as important. Automation of repetitive tasks—measurements, comparison with previous examinations, structured reporting, image segmentation, and retrieval of clinical information—could potentially allow radiologists to devote more time to activities requiring medical judgment and human interaction.

AI could also help transform complex radiological information into educational material adapted to individual patients. Future systems might generate diagrams showing the location of a lesion, simplified explanations of imaging findings, or visual comparisons between normal anatomy and the patient's abnormality. The radiologist's role would then shift from simply producing information to validating, contextualizing, and explaining it.

This distinction will become particularly important because patients themselves will have increasing access to generative AI. A patient receiving an MRI report may immediately

submit its contents to an AI system and ask, "Do I have cancer?", "Will I need surgery?" or "Is this finding serious?" The quality of the answer will depend heavily on the information provided and may not reflect the full clinical context. Radiologists and referring physicians will therefore increasingly encounter patients who arrive with an AI-generated interpretation of their imaging report. Rather than competing with these tools, physicians will need to provide something AI cannot reliably offer on its own: clinical responsibility, contextual interpretation, management of uncertainty, and integration of imaging findings with the individual patient's situation.

Communication of uncertainty will become a core radiological skill

Imaging rarely provides absolute certainty. Radiologists constantly work with probabilities: lesions may be typical, probably benign, indeterminate, suspicious, or highly suggestive of a particular diagnosis.Physicians understand this probabilistic language, whereas patients may interpret uncertainty as diagnostic failure. Direct patient access to reports therefore makes communication of uncertainty increasingly important. Radiologists will need to explain not only *what is visible*, but also *how certain the interpretation is* and *what should happen next*.

A statement such as "an indeterminate 8-mm lesion is present" provides little reassurance to a patient. Explaining that the lesion has predominantly benign imaging characteristics but that comparison with previous examinations or follow-up imaging is recommended provides considerably more meaningful information. The future radiologist may therefore increasingly function as a specialist in managing diagnostic uncertainty.

Imaging consultations may emerge as a new model

For selected clinical situations, the concept of a radiological consultation could develop further. Patients with complex imaging histories—multiple examinations, chronic musculoskeletal disorders, oncological follow-up, incidental findings, or conflicting previous interpretations—could benefit from a dedicated consultation with a radiologist. During such a consultation, the radiologist could review examinations longitudinally, explain the evolution of abnormalities, distinguish significant findings from incidental abnormalities, and clarify the strengths and limitations of additional imaging.

Musculoskeletal radiology is particularly well suited to this approach. Patients frequently arrive for ultrasound, CT, or MRI with pain that does not correspond perfectly to structural abnormalities. Showing a patient the images and explaining that a degenerative meniscal tear, disc protrusion, tendon abnormality, or cartilage lesion may not necessarily be

the cause of symptoms can significantly influence expectations and subsequent management.

Ultrasound already provides an interesting model because examination and interpretation occur simultaneously. The radiologist can correlate imaging abnormalities directly with the patient's symptoms, perform dynamic maneuvers, and explain relevant findings during the examination. This direct interaction may become an increasingly valued component of imaging practice.

Preserving human interaction in increasingly technological radiology

Paradoxically, the increasing sophistication of radiology may make human interaction more important rather than less important. Future imaging departments will probably contain increasingly automated workflows. Algorithms may prioritize examinations, detect abnormalities, perform measurements, generate preliminary reports, and recommend follow-up. Yet patients will still experience fear when an unexpected lesion is discovered, uncertainty when imaging is inconclusive, and anxiety when additional investigations are required. These situations cannot be addressed adequately by technology alone.

The radiologist of the future may therefore combine two apparently opposite roles: highly specialized expert in imaging technology and accessible physician capable of translating complex information into meaningful clinical explanations. This evolution does not require radiologists to communicate every result personally to every patient. Imaging volumes make such an approach unrealistic. Instead, future radiology departments may develop structured communication pathways: routine normal examinations may require little direct interaction, whereas significant unexpected findings, complex diagnoses, interventional procedures, and situations involving substantial uncertainty may trigger direct communication.

Ultimately, the future of radiology may not be defined solely by better images or more powerful algorithms. It may also be defined by a transformation in how radiological knowledge is communicated. As AI assumes a growing proportion of technical and repetitive tasks, one of the radiologist's most distinctive contributions may become increasingly apparent: transforming images into clinically meaningful information and helping patients understand what that information means for them.

The radiologist of the future may therefore become simultaneously more technological and more human—less visible as a producer of reports alone, and more visible as a physician who interprets, explains, reassures, and guides.