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Predictive AI

helps radiologists meet the challenges of radiology

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qER Suite
Enable timely care with Head CT AI

qMSK Shoulder
AI assistant to spot signs of fracture

MAMMOSCREEN
Powered by Therapixel
AI for Breast Cancer Screening

qXR – TB
AI powered TB care cascades

qMSK Forearm

qMSK Pelvis

qCT Adaptable AI
Catching lung cancer early

qXR – NvA
Complete reporting assistance on CXRs

qMSK Wrist

qMSK Fingers

qMSK Knee

qMSK Tibia–Fibula

qMSK Ankle

qMSK Foot

**qMSK Toes**
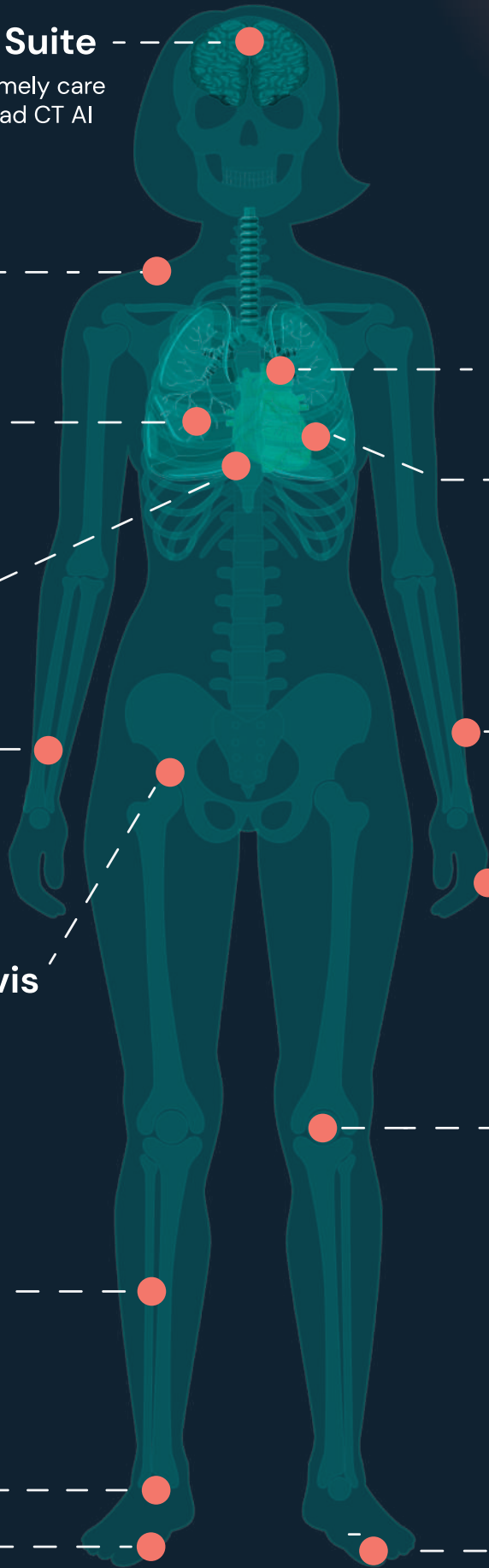
Modern clinical management relies heavily on the imaging or radiology department. With the shift from invasive to non-invasive examination techniques, the volume of imaging is increasing even more, which adds to the complexity of the radiology workflow. The increased workload and cognitive overload lead to decreased efficiency, reporting accuracy, and patient safety. Fortunately, AI has made tremendous strides in recent years and is now assisting radiologists by addressing many of these challenges.

1 Ever-increasing volume of images

2 Delay in reporting

3 Obstacles in the radiology workflow

4 Accuracy of reports

5 Radiologists are scarce and workloads are rising
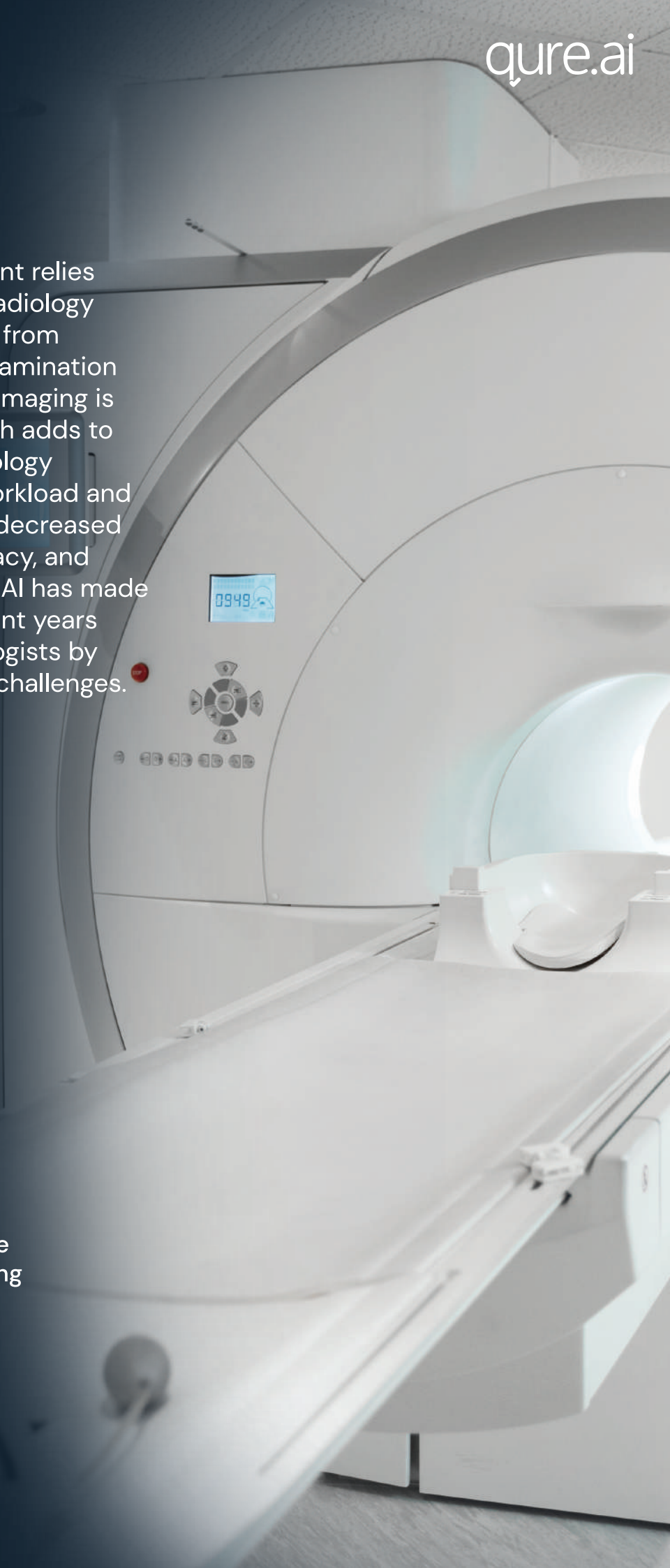
The ever–increasing volume of images

requires proper time management to ensure timely reporting. Many redundant processes, such as inefficient case allocation, consume valuable clinical time.

AI can help make things more efficient and save time. It can perform a preliminary triage of normal and abnormal scans[1]. This creates two batches; one of normal images for faster reporting and another with some abnormalities that can be reported in focused hours. AI can also flag technical shortcomings before the image is opened and automatically order repeat imaging for the patient.

Delay in reporting is influenced by many factors

These can be as trivial as a disorganised workspace where systems are lacking or SOPs are not followed. Inefficient and arbitrary allocation of cases also contributes to the delay in reporting which leads to backlogs and sometimes backdated reporting. All these issues can be caused by factors outside the department's control, such as changing priorities, urgent firefighting issues taking precedence over tasks, interrupted meetings, visitors, etc.

2

AI can help
reduce delays

AI can help in smart
allocation of cases

FOR EXAMPLE

A radiologist can schedule a certain number of hours in the afternoon to go through complicated cases and schedule a time to go through easy ones. AI can help organise the reporting of these cases according to their preferences. AI can also help to adhere to SOPs and perform intelligent scheduling based on radiologist availability and workload. AI can formulate the first draft report for the radiologist's sign-off with the flexibility if the radiologist wants to make some changes, thus easing the workload and avoiding delays in reporting complicated and normal cases.

3

There are many obstacles in the radiology workflow

with the ever-increasing role of radiologists in various clinical areas such as multidisciplinary meetings, tumour boards, precision medicine, etc. complexity increases at each step.

AI can be used to automate or optimise many time-consuming steps. It can help with **'personalised standardisation'** for each radiologist. It can personalise the selection of cases, the type of cases, the time of reporting, and the pre-populated template for reporting, thus optimising many steps in the radiological workflow[1].

4

Accuracy of reports is critical
as disease management depends on the report generated. Most radiologists often have to re-report cases with suspicious findings.

AI can help identify these suspicious cases more efficiently. This includes 'secondary captures', which mark and highlight the findings on the image, which can reduce re-reporting by helping the clinician to locate the finding on the image[2]. AI also acts as a second reader for the radiologist, helping junior radiologists to reduce their errors and accelerate their learning curve[3]. By providing visual assistance, AI also helps to report images more quickly, even for complicated or rare conditions. This increases accuracy and avoids missed findings in the report.

Radiologists are in short supply, and workloads are increasing so each radiologist's working time should be optimised. Given the increasing workload complexity, this is not easy to achieve manually.

AI can help reduce scanning time by optimising the use of scanning equipment. AI facilitates the optimisation of imaging protocols while reducing radiation doses, which also benefits patients. AI can estimate the pattern of cases on certain days of the week and thus automatically schedule radiologists to report those cases. AI can generate charts and graphs showing workload distribution over weeks or months, helping to optimise staff utilisation. AI can also predict no-shows, reducing wasted resources[1].
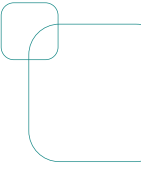
Conclusion

With the increasing workload and complexity of the radiology profession, there is an urgent need for modern technologies such as AI to provide additional support. This support can take many forms, such as staff and/or worklist optimisation, reduction of routine work, measurement automation[4], etc. This will help the department achieve higher levels of efficiency. AI can also assist healthcare decision-makers by optimising resource allocation, such as recruitment and remuneration. AI insights can also be used to make strategic decisions such as partnerships, thereby helping to manage resources. The foundation of a leaner, smarter, and faster organisation will depend on the level of optimisation it can achieve through AI. AI is transforming radiology from a subjective skill into an objective science. Various elements of radiology are changing with the introduction of AI. AI helps to improve both workflow and thought processes[5]. There is a need to understand the multiple steps involved in introducing AI for better assimilation in the current workflow[6]. New types of leaders are emerging, taking this momentum forward[7]. With the increasing role of AI in radiology, it will soon change from **'artificial intelligence'** to **'automated intelligence'.**

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Professor Dirk Pickuth is the Head of the Department of Radiology and former longstanding Medical Director at the CaritasKlinikum, Saarbrücken, Germany. He is the founding Director of the Digital Innovation and Strategy Hub (DISH), responsible for driving digital transformation across all radiological, clinical, operational, and corporate environments. He also established the International Department of Artificial Intelligence in Medicine and Imaging (id:ai:mi). Professor Pickuth is the Lead for the Faculty of Medical Leadership and Management in Europe. As a digital leader with an impressive track record of driving successful technology and business transformation programmes, Professor Pickuth advises on digital transformation, including information governance, in many countries. He has authored several textbooks, including 'Clinical Radiology' and 'Healthcare Executives – The Essentials for Excellence in Leadership and Management'. Professor Pickuth was awarded numerous visiting and honorary professorships at distinguished European universities. His work has also been independently recognised with Honorary Doctorates epitomising the significance and lasting impact of his accomplishments.

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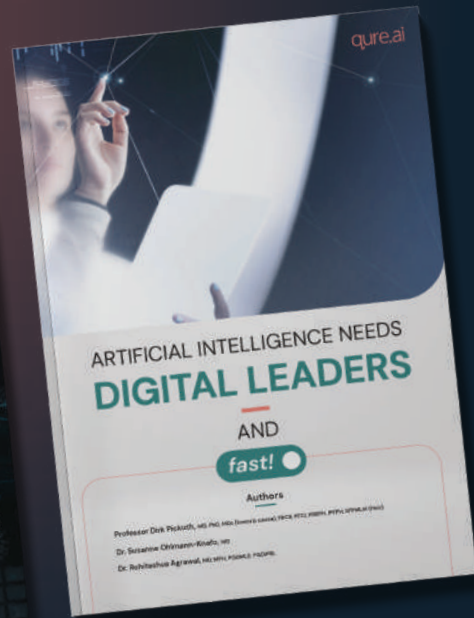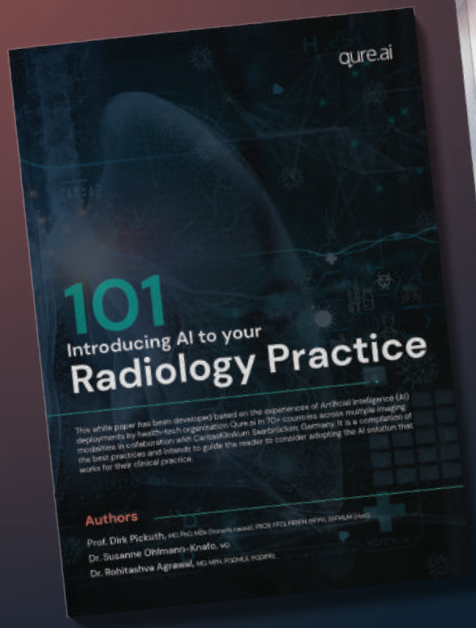
A guide to maximising radiology efficiency using AI

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