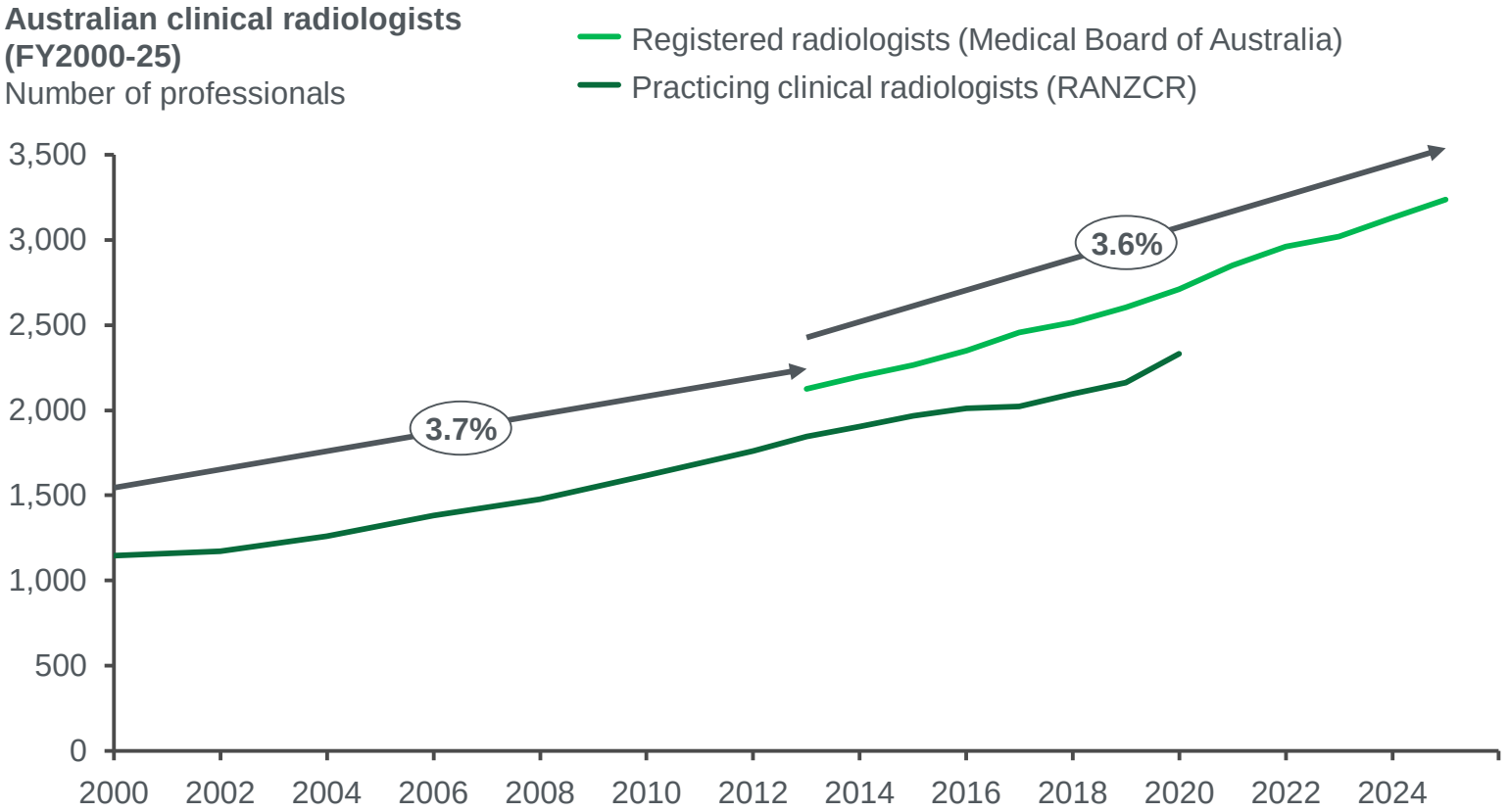
AI in Radiology

Radiologist productivity increased by c.0.5% p.a. since FY2000, enabled by technology adoption, with Medicare-supported services outpacing growth in the number of radiologists

Australian clinical radiologists (FY2000-25)
Number of professionals



100	108	106	107	111	111	114	121	115	113	114	115	Index of MBS supported services per radiologist*
45	44.7	43.2	41.9	41.0	41.5	41.8	46.1	42.2				Average hours worked per week

Drivers

- There have been long-running shortages of radiologists in Australia; even in 2020, 56% of radiologists reported working over 1.0 FTE
- RANZCR has taken steps to double trainee numbers between 2000 and 2016 and have broadly tracked workforce growth; a large share of the workforce remain international medical graduates (25% in 2020)
- Radiologist productivity has also enabled the sector to keep up with demand; this has been facilitated by technology adoption and enhancement, including:
  - **Digitisation of diagnostic imaging systems:** e.g. instant access to digital images through PACS
  - **Teleradiology:** used to mitigate workforce limitations in regional areas
  - **Artificial intelligence:** e.g. workflow management, image decision support and voice dictation

Note: * Based on a headcount basis only (2000=100)
Source: RANZCR 2020 Clinical Radiology Workforce Census Report; Australia Department of Health and Aged Care; ABS; MBS; L.E.K. analysis

Integrated OEM, RIS and PACS DI systems provide the backbone of radiologist productivity, enabling faster acquisition, seamless workflow and data-driven reporting

Digitisation of diagnostic imaging systems

Image acquisition

Scanning equipment procured from OEMs

- Advances in scanning technologies are **creating new markets** and **enhancing image quality,** which improves the diagnoses provided by radiologists
- Often offer features such as auto-positioning, motion handling, faster MR (via AI recon), **reducing handling time** per patient and image re-takes
- Radiation dose management tools aim to **minimise patients' exposure to radiation** from CT and X-ray treatments; digital tools are typically directly tied to the modality and control that standard protocols and best practices are met
- Contrast dose management tools likewise aim to **minimise contrast media intake** of patients, which can be harmful in rare instances

Scheduling, vetting and reporting radiology images

Radiology Information System (RIS)

- Allows for **effective administration and reporting** in radiologist workflow (order list), reporting, billing and administration
- Integrates with
  - PACS software for medical image viewing and with HIS for efficient order entry and report management
  - ERP integration for billing and consumables management
- Includes patient consent tools to ensure **compliant documentation** of patient consent with treatment procedures

Archiving and managing images digitally to provide convenient local and remote access

Picture Archiving and Communication System (PACS)

- Provides an electronic platform to archive and **view medical images**
- Connects with RIS to **support radiology workflow**
- Can transfer data to VNA (where deployed) for better data sharing and exchange

Archiving images digitally in a vendor-neutral manner

Vendor Neutral Archive (VNA)

- Archives images and documents enterprise-wide in a vendor-neutral format (i.e. integrates images from various vendor machines and modalities)
- **Stores radiology images** but importantly also images from other departments and formats in a vendor-neutral manner
- Access to images usually enabled via a universal viewer (web-based, multi-device)

Source: L.E.K. research and analysis

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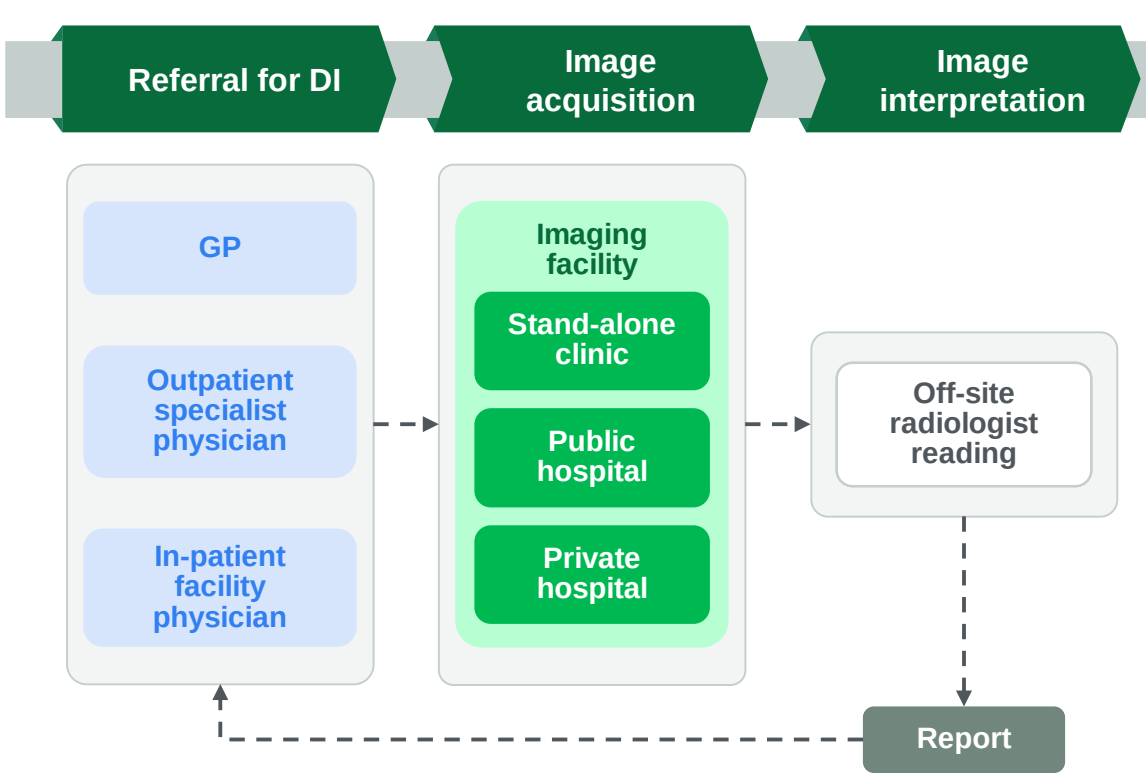
Going forward, advancements of the DI technology ecosystem facilitate the use of teleradiology, which can further improve radiologist productivity, patient outcomes and workforce flexibility for radiologists

Teleradiology

Teleradiology process and benefits



- Teleradiology refers to the sharing of diagnostic images from hospitals or clinics to external providers for the purposes of interpretation and report generation across both traditional and advanced imaging modalities
- When a DI facility does not have an available radiologist, images can be sent off-site for interpretation; a report is then generated and returned to referring doctors
- Adoption of teleradiology is highest for out-of-hours reporting, and for routine overflow (particularly in regional areas); it also facilitates subspecialty reporting
- Teleradiology provides a number of benefits:
  - **Increases radiologist capacity and productivity** (addressing asymmetrical radiologist utilisation, especially during overnight and off-peak hours)
  - **Improves patient access and turnaround times** (e.g. regional areas do not need an on-site radiologist 24/7, and hospitals and clinics can access off-site specialists rapidly)
  - **Provides flexibility and workforce satisfaction** (offering radiologists the opportunity to work more flexibly, from anywhere)

Source: L.E.K. interviews, research and analysis

In addition, AI offers opportunities across the full imaging workflow, from referral to report and result acknowledgement

Artificial intelligence

Overview of diagnostic imaging workflows

	Referral and planning	Image scan/ acquisition	Routing and interpretation	Reporting and QA	Communication and admin
Activities	• Clinician requests imaging • Booking, referral capture and scheduling	• Radiographer/sonographer positions patient • Scan performed	• Images routed to radiologist • Radiologists interpret images, compare with priors and patient history	• Radiologist documents findings • Reports undergo peer or QA review before sign-off	• Reports delivered to referrers, often with follow-up queries • Billing completed
Opportunities for AI	• Clinical decision support for exam ordering • Automated scheduling and rostering reduce administrative load	• Automated patient positioning and setup • Image reconstruction and enhancement	• Automated detection and triage of findings • Diagnostic decision support	• Speech recognition • Structured reporting	• Automated communication and billing • Closed-loop alert and follow-up systems

Core activities of radiologists

Source: L.E.K. interviews; research and analysis

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High-impact, wide-reaching productivity tools lead adoption, while clinically focused AI offers deeper benefits but faces lower relative adoption

Artificial intelligence

Core radiologist activities that benefit from AI

	Referral and planning	Image scan/ acquisition	Routing and interpretation	Reporting and QA	Communication and admin
Examples	• ACR Select • Allocate Optima • ESR iGuide • GE Smart Scheduling	• GE Auto Pos • Canon Intelligent Protocol • Siemens Deep Resolve	• Aidoc • Annalise CXR* • Arterys • md.ai • Viz.ai • Rapid AI	• Nuance PowerScribe • Smart Reporting QA • RadGPT	• Rad AI Continuity
Productivity benefits	• Improved scanner utilisation and resource allocation	• Faster acquisition and fewer repeats	• Faster interpretation (though many radiologists perceive this to be at least partially offset by oversensitivity and false positives)	• 30% faster-report turnaround for radiologists**	• Auto-fill communication suggestions based on historical patterns
Clinical effectiveness benefits (e.g. accuracy)	• Fit-for-purpose scan appropriateness and protocol selection	• Reduced radiation exposure	• Faster urgent diagnosis • Algorithms improve accuracy and sensitivity	• Consistent reporting and quality assurance	• Closed-loop alerts ensure critical results are actioned
Relative adoption	• Intelligent scheduling/rostering software is used extensively	• Embedded vendor-native features on scanners are routinely in use	• Intelligent triage/worklists are extensively used across large networks/teleradiology • Mixed day-to-day use of single-finding computer-aided detection to pre-analyse scans and highlight any suspicious regions, with radiologists validating results	• Highest across the chain: voice recognition is mainstream, while LLM/report-assist pilots are scaling; first users piloting generative AI tools to draft near-complete reports (e.g. chest X-rays, CTs), with radiologists validating and signing	• Uneven adoption, with greater use in emergencies (stroke pathways) to send alerts directly to neurologists and ER teams

Level of benefit / adoption Limited → Highest

Note *Part of Harrison.ai, which builds and commercialises clinical AI, including radiology (Annalise.ai) and pathology (Franklin.ai); **As per discussion with CEO, RIS / PACS Provider

Source: L.E.K. interviews; research and analysis

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The AI imaging software market is fragmented with specialised tools, requiring adoption prioritisation due to the many number of options, though integrated platforms are starting to gain ground

Artificial intelligence

Exam type	Specialty	Main related diseases	Example providers of AI software*
X-ray	Chest X-ray	Pneumothorax, lung cancer	gleamer, MILVUE, qure.ai, Lunit, annalise.ai, NANOX
	Head X-ray	Skull fractures, birth defects, pituitary tumour	qure.ai
	Back X-ray	Vertebral compression fractures	NANOX
	Other X-ray	Foot, rib, clavicle fractures	gleamer, MILVUE, NANOX
	Mammography	Breast cancer	gleamer, MILVUE, Lunit, SCREENPOINT Medical, CureMetrix, densitas
Ultrasound scan	Ultrasound scan	Liver cancer, gallbladder disease, genital problems	qure.ai
CT scan	Head CT	Intracranial haemorrhage	qure.ai, aidoc, iz.ai, annalise.ai, Methinks, RAPID AI, iz.ai
	Chest CT	Cardiac/pulmonary problems, lung cancer, rib fractures	gleamer, MILVUE, qure.ai, aidoc, iz.ai, Quibim, NANOX, contextflow, Predible
	Back CT	Acute C-spine fractures	gleamer, aidoc
	Abdomen CT	Intra-abdominal free gas	aidoc
MRI	Head MRI	Brain tumours, atrophy, parkinson, alzheimer	gleamer, Quibim, Quantib, ai analysis inc., RAPID AI, iz.ai
	Back MRI	Musculoskeletal (MSK) disorders	gleamer, Quibim
	Other MRI	Breast cancer, prostate cancer	Quibim, Quantib, ai analysis inc.

- A **large and fragmented offering of AI tools** spans across pathologies and imaging modalities, yet **their hyper-specialisation forces radiologists to prioritise**, as it is not feasible to purchase a dedicated solution for every equipment and every disease
- AI solutions are typically priced as **pay per use or annual subscriptions**, averaging €1-2** per conventional exam and €3-10** per advanced exam, **representing a marginal share of total exam costs** (€30-70 for conventional imaging and €60-300 for advanced imaging), yet with **no reimbursement support from public health insurance**
- **One-stop-shop platforms are emerging**, with **integrated providers aggregating multiple AI modules** (e.g. Incepto, Carpl.ai, Deepc), reducing the need to manage multiple specialised vendors and streamlining adoption for radiologists

Note: *Nonexhaustive; **Figures derived form market feedback may vary significantly depending on vendor, customer negotiations and contract terms
Source: L.E.K. research, interviews and analysis

As a result of this proliferation of solutions, AI marketplaces are gaining traction as a distribution mechanism that benefits both customers and AI developers

Artificial intelligence

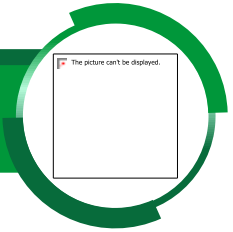
Diagnostic providers

Diagnostic provider has access to the AI app

Marketplace

AI app is listed on the marketplace

AI-software services



Benefits for marketplace customers

- Facilitates **access to a larger base of AI solutions** without each professional having to do individual research, as the marketplace takes care of the set up
- **Reduces integration spend** and effort ("it just works") as part of the chosen imaging system
- **Saves time and effort spent on entering patient data** into a completely separate AI software
- Minimises time spent on **security concerns and worries about data privacy**
- Helps customers **peer review the app** in the marketplace for quick feedback

Benefits for marketplace

- Revenue from listing and commission fees
- Market intelligence (which solution is being used in which vertical, how often and for what cost) – for potential M&A or other types of partnerships
- Potential sale of data for additional AI training
- Know-how and learning transfer on AI

Benefits for AI companies

(Includes a variety of stakeholders, e.g. AI start-ups, big techs, medtech)

- **Easy access to the marketplace customer base**, significantly reduces the marketing and sales effort required to reach such a customer base
- **Facilitates integration of the solution with marketplace customers**, with a reduced need for individual on-site integration, onboarding, training and customer support
- May assist in the **certification of the algorithm** with regulatory support and expertise
- Provides an alternative of outsourced **maintenance, support, training and IT infrastructure** operations

Source: L.E.K. research and analysis

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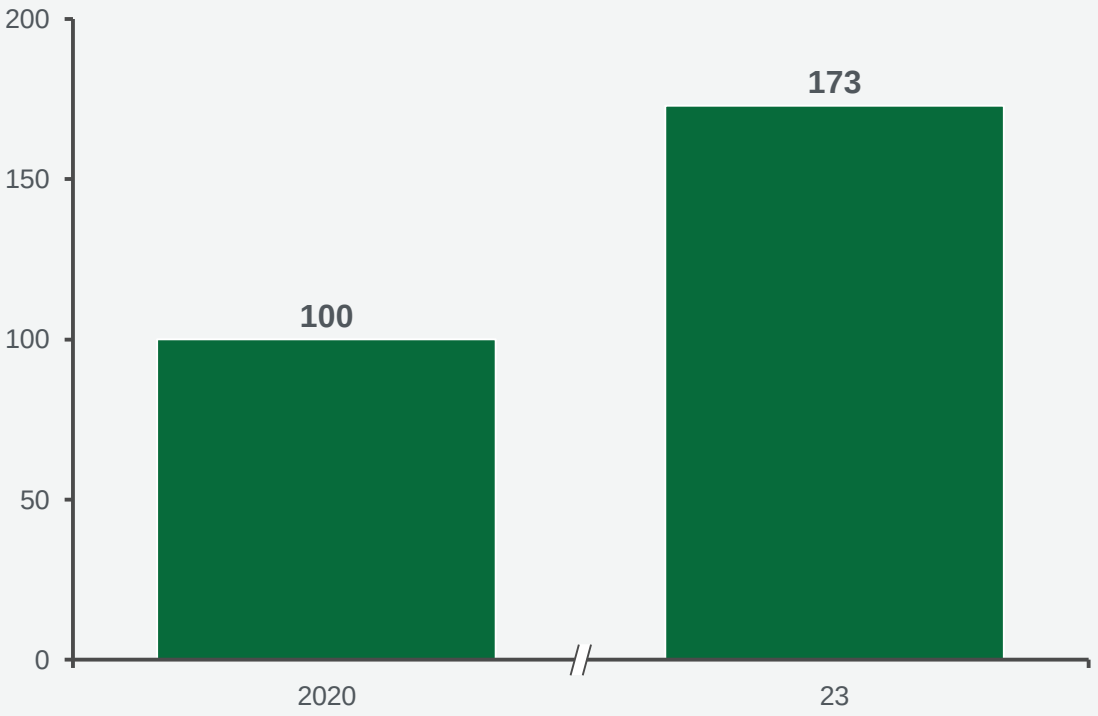
The number of CE-certified AI radiology solutions grew by 20% annually over 2020-23; one-stop-shop marketplaces have recently emerged to streamline adoption across hospitals and radiology centres

European case study

Number of commercially available CE-certified AI radiology products* (2020-23)

Number of products



Overview of selected** AI radiology software marketplaces

Company	HQ	# vendors	Selected vendors logos**
CARPL		75+	gleamer, qure.ai, CureMetrix, Lunit, MILVUE, aidoc, densitas, coreline
Blackford		60+	CureMetrix, gleamer, Lunit, aidoc, coreline, densitas, MILVUE
SECTRA		c.55	Combinostics, gleamer, Riverain, annalise.ai, qure.ai, coreline, Cercare Medical
deepc		30+	Lunit, PAIRE, aidoc, coreline, MILVUE, qure.ai, gleamer
INCEPTO		c.25	qure.ai, PAIRE, Lunit, gleamer, MILVUE
clarius		20+	coreline, aidoc, qure.ai, gleamer, Riverain, CureMetrix, annalise.ai, densitas
Microsoft / NUANCE		5+	Aeyr, SightIn Health
Magentus		c.5	qure.ai, medical-objects, healius

Note: *Based on a study from the European Society of Radiology based on AI products listed on www.healthairegister.com; **Nonexhaustive
Source: L.E.K. research, interviews and analysis

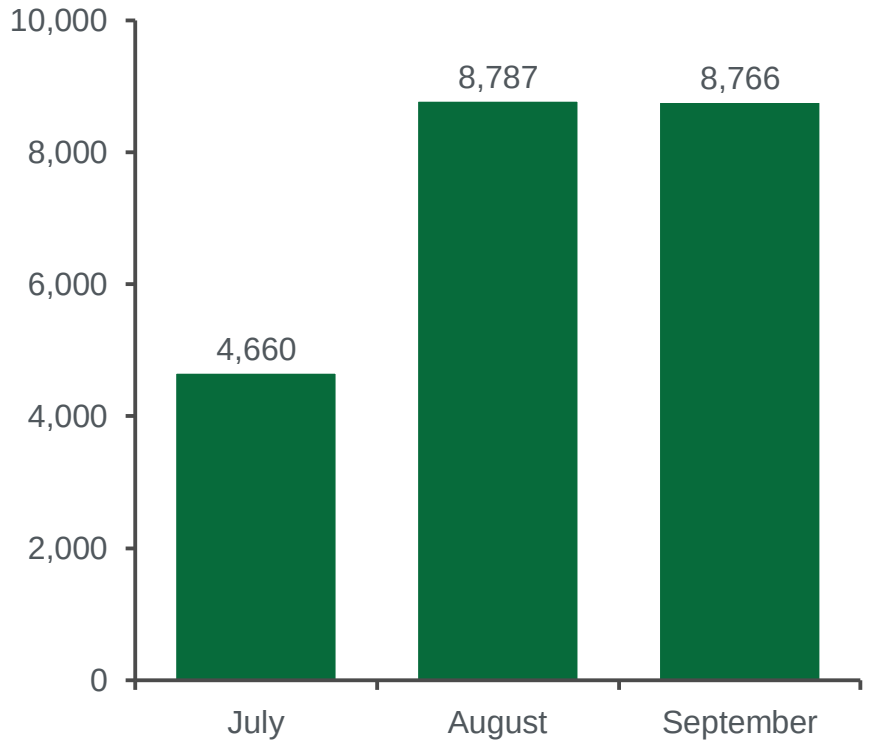
Recently in Australia, AI-enabled workflows have been streamlining the way radiologists deliver the National Lung Cancer Screening Program

Artificial intelligence

- The Australian Government has introduced Australia's National Lung Cancer Screening Program (NLCSP) to detect lung cancer earlier in high-risk people with the objective of reducing mortality
- Eligible people can go to participating radiology services (sites in public hospitals and private clinics) for:
  - an initial low-dose CT (LDCT) to set a baseline, and every two years
  - shorter 'interval scans' to monitor nodule growth
- Scans are reported using the National Lung Cancer Screening Program Nodule Management Protocol, which is derived from
  - the Pan-Canadian Early Detection of Lung Cancer Study (PanCan) nodule malignancy risk calculator; and
  - the Lung Imaging Reporting and Data System (LungRADS®)
- Reading and reporting are radiologist-led; however many vendors are taking advantage of AI; for example, Philips offers AI-assisted algorithms to speed review and standardise NLCSP reporting via its Advanced Visualisation Workspace (AVW)

National Lung Cancer Screening Program (NLCSP) FY2026

Number of Medicare funded services



Note: *MBS codes 57410 and 57413

Source: MBS; NLCSP Program Guidelines; Philips; L.E.K. research, interviews and analysis

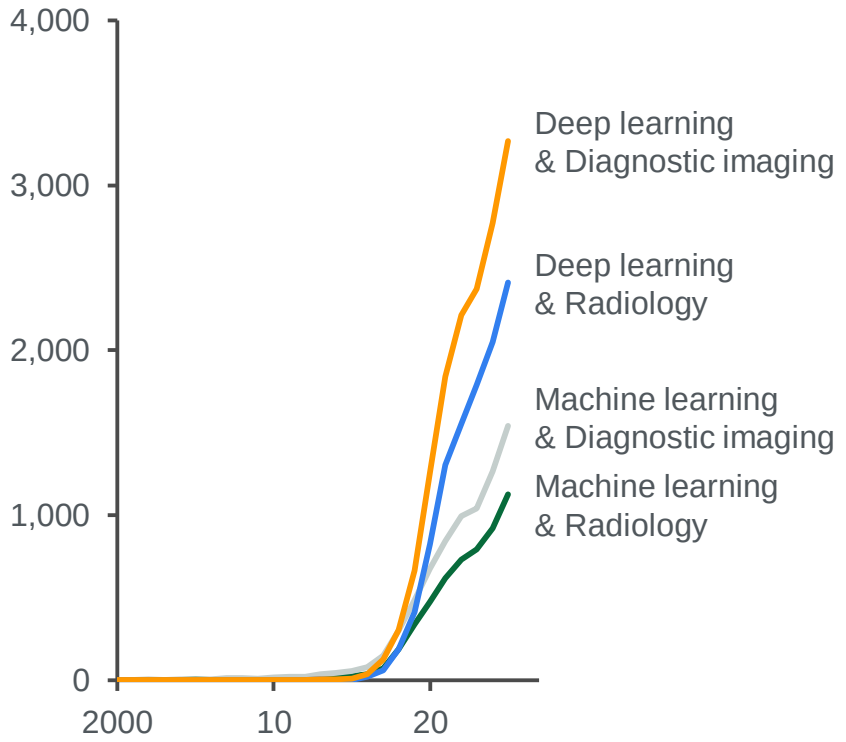
Looking forward, AI innovation in diagnostic imaging is accelerating, but adoption is reliant upon regulation, radiologist workflow integration and unit economics

Artificial intelligence

- Each clinical algorithm requires clinical validation and regulatory approval, even when aggregated; implicitly this results in a longer R&D timeline, including clinical trials
- After approval, radiologist uptake depends on seamless workflow integration and favourable economics
- Aggregator platforms are emerging to simplify integration, but they do not remove validation or reimbursement barriers; for example, solutions like CARPL.ai, Blackford Analysis and Aidoc offer single-point integration with multiple algorithms, improving access and workflow efficiency, yet each algorithm still requires individual approval and local validation before clinical use
- Radiology AI is moving beyond traditional ML toward LLM and multimodal models which will accelerate innovation, but adoption could be limited by regulatory and workflow constraints
  - Radiology AI innovation has so far been powered by traditional machine learning, delivering faster and more accurate image analysis
  - Large language and multimodal models are now beginning to extend these capabilities, enabling broader diagnostic reasoning and potentially shorter development cycles; for example, Harrison.ai's next-generation radiology foundation models have accelerated through LLMs
  - However, adoption of such models will remain gradual, constrained by regulatory scrutiny, workflow integration challenges and economic considerations

AI research papers related to diagnostic imaging (CY2000-25*)

Number of research papers



Notes: *The number of research papers published in 2025 has been annualised
Source: PubMed; L.E.K. interviews; research and analysis

Private DI networks, and PACS and OEMs lead AI deployment due to aligned economic incentives and flexible infrastructure; public hospitals are more likely to face procurement and funding barriers

Artificial intelligence

Stakeholder	Advantages	Disadvantages	Strength of position
 **Scanning OEMs**	• Ability to integrate AI into scanning hardware • Proven productivity gains (e.g. faster MR, fewer repeats) • Strong regulatory capability and global data access	• Limited share in downstream workflow value • Capex-driven sales cycle; slow public procurement • Medicare doesn't reward imaging speed • Medicolegal exposure if embedded AI misdiagnoses	
 **PACS developers**	• Natural home for triage, detection and visualisation AI • Cloud platforms enable network-wide deployment • Private groups ready adopters	• Legacy on-premises systems in public hospitals slow rollout • Integration costly and vendor-specific • No direct reimbursement; must prove ROI • Liability risk if overlays mislead readers	
 **RIS developers**	• Control reporting, QA and billing layer, where there are clear reporting productivity gains • Able to deploy marketplaces for imaging workflow	• Minimal diagnostic impact; limited clinical value • Dated hospital RIS platforms • Weak financial incentive; faster reports not reimbursed	
 **Public hospitals**	• Rich multimodal datasets for validation • Credibility for trials and research • State grants may support pilots	• Complex procurement and cybersecurity barriers • Fixed budgets and no throughput reward • Low incentive for speed gains • High medicolegal caution limits experimentation	
 **Private clinic networks**	• Volume-based economics align with AI productivity gains • Cloud PACS enables fast deployment • Commercial agility and brand benefit from AI adoption of point solutions, marketplaces and partnering/JVs with AI companies (e.g. Sonic and Harrison.ai)	• No Medicare reimbursement; must self-fund investment • High medicolegal caution limits experimentation	

Key: Strong Medium Weak

Source: L.E.K. interviews, research and analysis

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Globally, DI networks have significant AI productivity goals – c.20-30% radiologist productivity savings could be achieved by 2030, representing 3min saving per year, with up to 50% savings in the longer term

Artificial intelligence

INDICATIVE

Core radiologist activities which benefit from AI

	Routing and image interpretation	Reporting and QA	Communication and admin
Time allocation before AI	35%	35% 36%	71% 29%
	Acquired images are reviewed by radiologists, who analyse abnormalities, compare with prior studies and reach a diagnosis	Acquired images are reviewed by radiologists, who analyse abnormalities, compare with prior studies and reach a diagnosis	The referring healthcare provider communicates the radiology report to the patient, explaining findings, diagnosis and treatment recommendations
Time allocation with AI possible today (pilots)	22%	22% 23%	55% 24%
	Generative AI tools to pre-analyse scans, highlight suspicious regions and propose preliminary interpretations, with radiologists validating results and focusing on complex or ambiguous cases	Generative AI tools to pre-analyse scans, highlight suspicious regions and propose preliminary interpretations, with radiologists validating results and focusing on complex or ambiguous cases	AI triage platforms are in use in emergencies (stroke pathways) to send alerts directly to neurologists and ER teams
Time allocation in planning horizon (longer-term goal)	18%	18% 18%	36% 13%
	AI copilots could highlight overlooked findings, surface priors and reduce diagnostic variability	Fully structured reports, automatically populated with AI-generated measurements and images Future productivity enabled by report auto-generation for simple cases (e.g. lung nodule detection) enabling radiologists to focus on verification and complex cases	AI could enforce closed-loop communication (ensuring reports are acknowledged) and send automated follow-up reminders for incidental findings
Total future AI impact (Today vs future)	**(17)ppt**	**(18)ppt**	**(16)ppt**

Σ= (50)ppt

Key: Time allocated to the specific task; Time allocated to the other tasks of the workflow; Time saved across the workflow

Source: L.E.K. research, interviews and analysis

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Radiologists will remain essential as technology shifts from efficiency gains to new modalities and advanced diagnostics, with scanners and clinic operations continuing to underpin care delivery

Artificial intelligence

Long term radiologist productivity is unlikely to slow down

- Over the past two decades, radiologist productivity has increased roughly 0.5% p.a. through digitisation, PACS/RIS adoption and speech recognition; **incremental gains will depend on workflow automation and reporting AI**, which remove low-value tasks rather than reading time itself
- **Sustained uplift requires continued infrastructure modernisation** (cloud, interoperability) to enable AI orchestration

The role of the radiologist at diagnostic imaging clinics is likely to remain fundamental

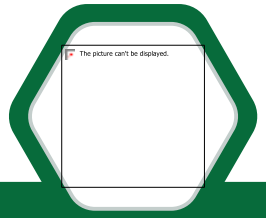
- **Scanning will always be required, regardless of automation;** radiographers and sonographers remain essential for patient preparation, safety, and scan quality assurance; embedded AI improves throughput and consistency (auto-positioning, motion correction, DL reconstruction), but human oversight ensures clinical and radiation compliance
- **Clinical accountability for interpreting incidental findings will remain with radiologists** – protecting both diagnostic accuracy and medicolegal defensibility; for example, WHO's 'Six principles to ensure AI works for the public interest in all countries' prioritises protecting human autonomy and responsibility

Long term radiologist productivity is unlikely to slow down

- **Radiology is becoming a multimodal discipline**, integrating imaging with pathology, genomics, and clinical data to support more holistic, disease-level decisions; multimodal diagnostics expands radiology's clinical scope, but **requires system-wide education**, which will take time
- **Radiomics and radiogenomics are early signals of this convergence**, linking imaging features to molecular and genetic markers, though today they remain research-driven and largely outside routine PACS/RIS workflows

Source: L.E.K. research, interviews and analysis

Ongoing radiologist productivity benefits, coupled with migration trends, indicates radiologist supply constraints may begin to ease



Ongoing radiologist productivity improvements

- **Digitisation of diagnostic imaging systems:** e.g. instant access to digital images through PACS
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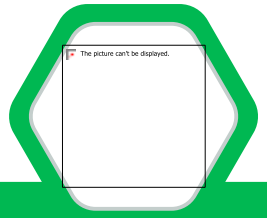

Enhanced overseas radiologist migration to Australia

- **Acceleration of migration:** The number of new fellows trained overseas has increased rapidly since COVID-19; in 2021 and 2022 there were an average of 34 new overseas-trained radiodiagnosis fellows each year (vs 6 p.a. in the prior four years)
- **Added policy support:** RANZCR has recently launched (July 2025) a "Defined Scope of Practice" pathway to enable suitably qualified international radiologists to work in targeted subspecialty roles while progressing to full recognition

These qualitative factors suggest supply constraints on radiologists and wage inflation may begin to ease

Source: RANZCR; Department of Health, Disability and Ageing; L.E.K. Analysis