

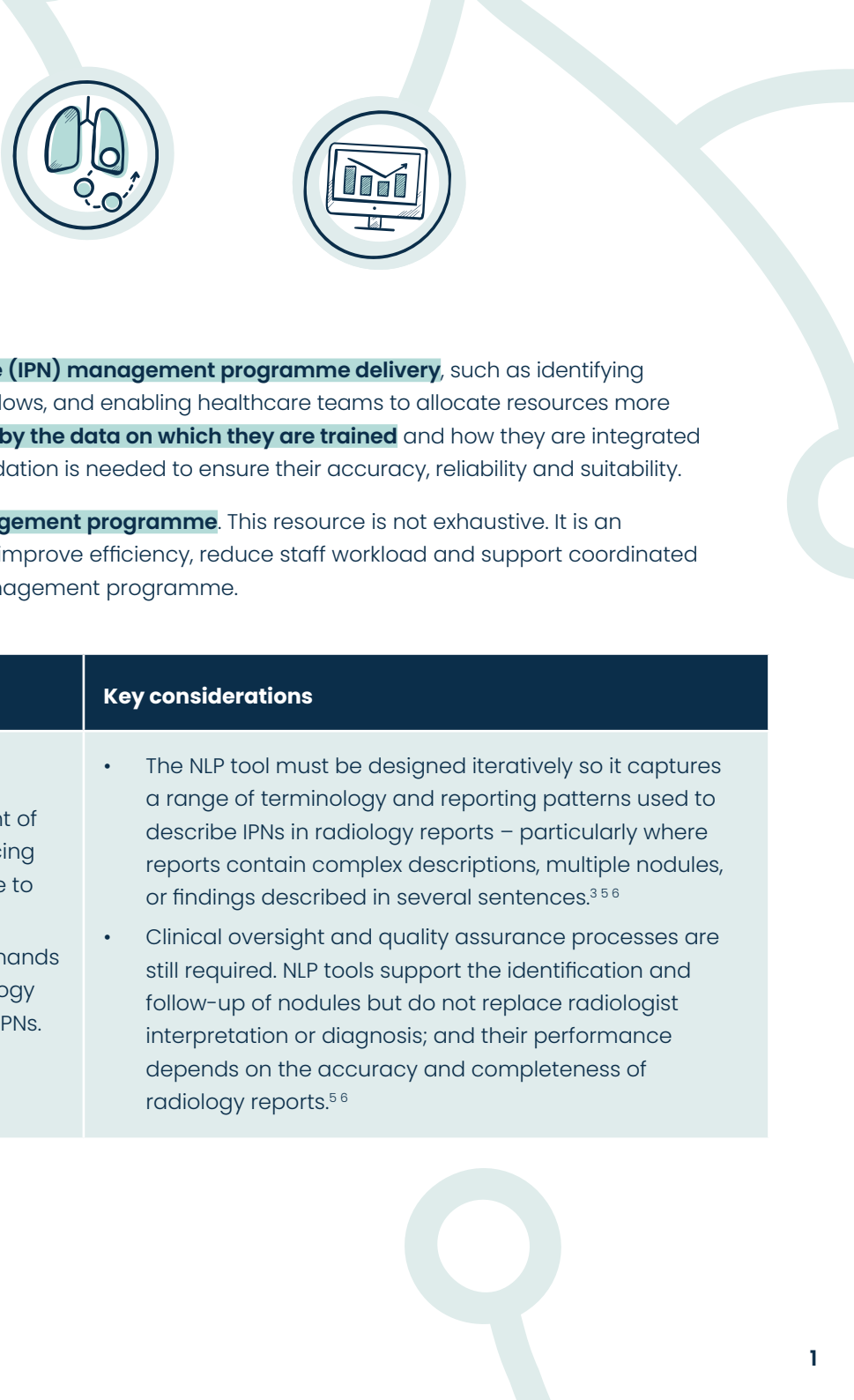
Supporting resource

Harnessing AI to build an effective and efficient IPN management programme

Artificial intelligence (AI) tools can assist with many aspects of incidental pulmonary nodule (IPN) management programme delivery, such as identifying nodules, streamlining administrative processes, supporting efficient triage and follow-up workflows, and enabling healthcare teams to allocate resources more effectively. However, these tools should be used with caution. **Their performance is influenced by the data on which they are trained** and how they are integrated into workflows, and may not be appropriate for every health system or population. Careful validation is needed to ensure their accuracy, reliability and suitability.

The table below **summarises some of the AI-enabled tools that can be used in an IPN management programme**. This resource is not exhaustive. It is an overview of how AI helps find, track and manage IPNs – and it demonstrates how AI tools can improve efficiency, reduce staff workload and support coordinated patient care. Use it to build a case for investing in AI solutions for your health system’s IPN management programme.

AI tool	Application	Potential benefits	Key considerations
Natural language processing (NLP) for radiology reports	The tool is implemented in your health system’s Picture Archiving and Communication System (PACS) and is trained to identify mentions of pulmonary nodules in radiology reports. ^{1,2}	Implementing this tool: ^{1,3,4} - supports large-scale assessment of guideline concordance by reducing reliance on workforce adherence to referral guidelines - reduces workforce capacity demands by continuously reviewing radiology reports for relevant mentions of IPNs.	- The NLP tool must be designed iteratively so it captures a range of terminology and reporting patterns used to describe IPNs in radiology reports – particularly where reports contain complex descriptions, multiple nodules, or findings described in several sentences.^{3,5,6} - Clinical oversight and quality assurance processes are still required. NLP tools support the identification and follow-up of nodules but do not replace radiologist interpretation or diagnosis; and their performance depends on the accuracy and completeness of radiology reports.^{5,6}



AI tool	Application	Potential benefits	Key considerations
Imaging review	The tool is implemented in your health system's PACS. It conducts a 'first read' of imaging to identify potentially malignant pulmonary nodules.	Implementing this tool: ^{7 8} - reduces workforce capacity demands by reviewing imaging continually - facilitates the assessment of X-rays for IPNs, increasing the volume of imaging that can be processed.	- These tools can have a reduced diagnostic specificity when compared to experienced radiologists; there can be unnecessary follow-up imaging, so human oversight is still needed to validate the tool's findings.^{7 9} - The tool must be tested in your local population for accuracy and specificity, with continual feedback loops implemented to ensure its ongoing effectiveness.⁷
Scheduling and communication	The tool is embedded in your EMR and automatically schedules appointments based on guideline-concordant recommendations; it also provides basic communication to patients about their care.	Implementing this tool: ¹⁰ - supports efficient appointment scheduling and workforce coordination - reduces administrative workload while improving transparency and consistency in scheduling processes.	- Implementation may require several iterations before a stable and fully functional system is achieved.¹⁰ - The tool does not replace clinical, managerial or operational judgement.¹⁰ - Workforce input is still required to provide tailored communication and information to patients to ensure adherence to follow-up care recommendations.¹⁰
Triage	The tool is embedded in your programme workflow to help triage people with detected nodules.	Implementing this tool: ^{7 11} - improves diagnostic accuracy and triage efficiency - helps optimise resource allocation by reducing clinician workforce capacity demands - provides clinical decision support.	- Successful implementation requires ethical governance and adaptation to the local healthcare context.¹² - AI outputs may be influenced by subjective clinical judgements and require validation in different settings.¹³



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