



Barriers to implementation of Artificial Intelligence algorithm into routine clinical care: experiences across 5 NHS trusts in the UK.

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Objective

Artificial intelligence systems are being used to improve Fracture Liaison Services' identification of patients at very high fracture risk. We describe the governance steps to implement such systems in the UK public healthcare system.

Methods

Five NHS hospitals were selected for the implementation of the Nanox AI solution, which identifies vertebral fractures using existing CT images. A lead clinician in each hospital collaborated with Nanox AI and the University of Oxford to secure both information governance (IG) approval and IT support.

Results

The interval from project start to IG agreement varied from 5 to 13 months. The time from IG agreement to first patient scan analysed was 7 to 12 months with one site still in progress. Each site required a unique set of IG documents: Data Protection Impact Assessment (5/5 sites); Data Protection Agreement (2/5 sites), Digital Technology Assessment Criteria (2/5 sites) as well as other forms (Table). The content for each form varied between sites despite a single NHS template. A pre-installation IT form was sent for completion. IT delays were due to various reasons including working with 3rd party suppliers, availability of NHS IT staff and local capability to generate automatic forwarding rules.

Conclusion

Despite having a single NHS provider for England and Wales and prioritisation of AI, there is considerable variability in the types of IG forms required, IT capacity and capability that prolonged AI implementation. Consideration should be given to a single point of IG approval and central IT resources to optimise AI adoption in the NHS.

Table: Time to approval & IG forms required by each hospital

Timelines	Hospital A	Hospital B	Hospital C	Hospital D	Hospital E
Date of collaboration agreement	03/23 ¹	04/22	04/22	04/22	04/22
Date of DPIA sign off	05/23	09/22	03/23	05/23	10/22
Time from collaboration sign off to local DPIA approval (months)	13 ¹	5	11	13	6
Date of first patient forwarded and analysed	12/23	09/23	12/23	TBD	11/23
Time from IG approval to first patient analysed (months)	7	12	9	>8	13
DPIA	X	X	X	x	x
DPA			X	x	
DTAC		X			x
IG checklist application		X			
Clinical risk management Plan		X			x
Clinical risk management System		X			x
Clinical safety Case Report		X			x
Clinical safety Hazard Log		X			x
System level security template		X			
Third-party checklist contractor		X			
Cloud computing risk assessment			x		
Firewall request form			x		
Information security toolkit			x		
International Data Transfer Agreement			x		
Due diligence form				x	
Additional services request				x	
Caldicott approval form					x

Legend:

DPIA- Data Protection Impact Assessment; DPA- Data Protection Agreement; DTAC- Digital Technology Assessment Criteria

¹Hospital A did not sign the collaborative agreement until all documents were ready and so the time from the collaborative agreement to DPIA was set from April 2022.