Sandwell and West Birmingham Hospitals NHS

NHS Trust

Report Title	Imaging Artificial Intelligence Research Project		
Sponsoring Executive	Rachel Barlow, Chief Operating Officer		
Report Author	Dr Sarah Yusuf, Group Director for Imaging		
Meeting	Public Trust Board	**Date**	5th December 2019

1. Suggested discussion points *[two or three issues you consider the Trust Board should focus on]*

The paper outlines the detail of the exciting Artificial Intelligence project that the Trust is launching with IBM Watson in radiology. There is scope for further development of this partnership in the months ahead. The explicit intention of the programme is to release expert clinician time to focus on reports that most need specialist expertise.

The Trust is conscious of work across the NHS, and locally, in this field, and are seeking to collaborate widely with others to take forward a body of knowledge. Consistent with our work to develop our 2025 digital ambitions, we are supporting a faculty of learning among senior clinicians in the AI space. The aim is that that groupings will provide the intellectual energy to further this collaboration at pace.

Distinctively this proposition has moved from concept to contract in less than 7 months. This reflects the commitment of the Board to support innovation.

2. Alignment to 2020 Vision *[indicate with an 'X' which Plan this paper supports]*

Safety Plan		Public Health Plan		People Plan & Education Plan	
Quality Plan	X	Research and Development	X	Estates Plan	
Financial Plan		Digital Plan		Other *[specify in the paper]*	

3. Previous consideration *[where has this paper been previously discussed?]*

Initial scope was presented at Trust Board 07.02.19.

4. Recommendation(s)

The Trust Board is asked to note:
a.	The imminent launch of the first phase project
b.	The approach used for data governance, opt-out and public patient involvement.
c.	Areas of intended development for 2020

5. Impact *[indicate with an 'X' which governance initiatives this matter relates to and where shown elaborate]*

Trust Risk Register							
Board Assurance Framework							
Equality Impact Assessment	Is this required?	Y	X	N		If 'Y' date completed	
Quality Impact Assessment	Is this required?	Y	X	N		If 'Y' date completed	

SANDWELL AND WEST BIRMINGHAM HOSPITALS NHS TRUST

Report to the Public Trust Board: 5th December 2019

Imaging Artificial Intelligence Research Project
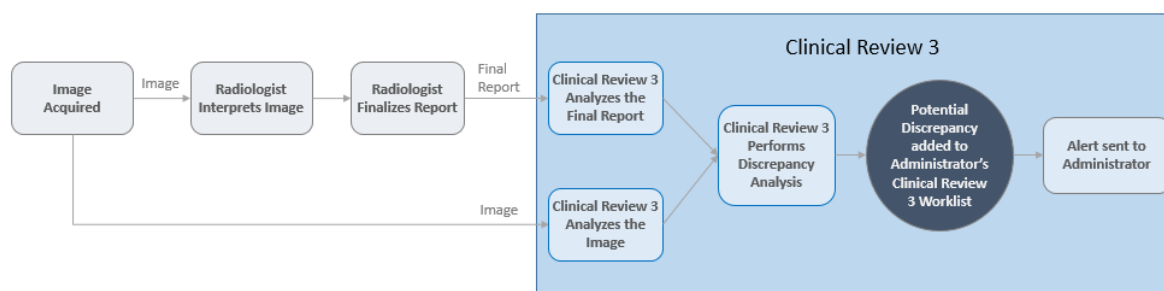
1.   Introduction

1.1   Within our Trust we perform circa 350,000 imaging studies per annum which are interpreted by radiologists. Brady, A.P. Insights Imaging (2017) 8:171–182 estimates an overall day-to-day discrepancy rate of 3-5% of radiology studies reported, with a higher rate for certain conditions. He also reported a retrospective error rate of approximately 30%. However, radiological diagnoses are not straightforward and may be subject to legitimate differences of expert opinion. This tool will aid the quality of the reports, improve patient experience and patient safety.

1.2   IBM Watson Health has developed a system which uses Artificial Intelligence (AI) algorithms to identify potential differences between X-ray or CT imaging studies and their associated radiology reports, after they have been reported by a radiologist. When the CR3 identifies a potential finding, it provides a worklist notification to the SWB radiologists to review the potential finding and assess its clinical significance.

1.3   INCLUSION CRITERIA : The CR3 system will potentially identify the following clinical conditions:

Chest X-ray:	Chest CT:
Pneumothorax	Pulmonary Embolism
Rib Fracture	Thoracic Aortic Aneurysm
	Lung Nodule
Abdominal CT:	Emphysema
Abdominal Aortic Aneurysm	

Clinical Review 3 Workflow

2.   Data Governance

2.1   This is a single centre and retrospective study. The data collection is triggered when the patient attends their scheduled X-ray or CT study and their images have been reported by the SWB radiologist.

2.2   SWB Imaging will use the patients' current de-identified images and reports, and also their previous de-identified images/reports going back three years.

2.3   The legal basis for processing is GDPR 6.1(e) and GDPR 9.2(j). Patients will be informed of their right to opt-out using the patient leaflet and website material (which will include the electronic version of the patient leaflet, Trust research privacy notice and on-line animation of the research).

3   Integrated Research Application Scheme (IRAS) submission to the Research Ethics Committee (REC)

As per NHS England guidelines, the research project needs approval by IRAS. This is a process by which studies are approved by REC using 3 elements

- Data governance (point 2)
- Patient perspective (point 4)
- Ethics. The project team attended a South Birmingham Research Ethics Committee on the 19th November 2019 and are waiting a formal response, but have revised the patient information leaflet, animation and protocol in accordance with discussions.

4   Public Patient Involvement Group

The project team have created a patient information leaflet (see appendix 1) which will be reviewed by the SWB Public Patient Involvement Group on the 12th December.

5   Future Areas of Development

SWB imaging have been in discussion with suppliers to progress further AI developments outlined below:

CT Liver single-phase imaging	Q1 2020
Fracture Detection in the Emergency Department (fingers, paediatrics)	Q2 2020
CT Prostate imaging	Q3 2020
CT Neuroradiology imaging	Q4 2020
Breast Screening mammograms (as second reader)	Q4 2020

6   Recommendations

The Trust Board is asked to note:

a. Update of project status
b. The approach used for data governance, opt-out and public patient involvement.
c. Areas of intended development for 2020.

Dr Sarah Yusuf
Group Director Imaging
27 November 2019