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Evaluating the ability of emergency department clinicians to interpret CT head scans following online training

Submission date
04/04/2022

Recruitment status
No longer recruiting

Registration date
19/05/2022

Overall study status
Completed

Last Edited
27/01/2025

Condition category
Other

[_] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[_] Record updated in last year

Plain English summary of protocol

Background and study aims
Computerised Tomography (CT) head scans are frequently requested by Emergency Department (ED) clinicians as one of the investigations for their patients. This often causes a delay when waiting for specialist radiologists to report the findings of the scan. The purpose of this study is to see if online training can improve the ability of ED clinicians to interpret the scans themselves, to a level sufficient to make clinical decisions based on their findings and to explore what aspects of this process they find most challenging.

Who can participate?
Emergency Department clinicians who are working in the Emergency Departments of participating sites between April to September 2022 (inclusive), who request CT Head scans as part of their routine clinical practice

What does the study involve?
180 ED clinicians will be recruited across 6 hospital sites in the United Kingdom. All will undertake a baseline online assessment to measure their accuracy in interpreting CT head scans. One group will then undertake an online training module, with a subsequent assessment immediately afterwards, then over the following 3 months will record interpretations for 30 CT Head images encountered in their routine clinical practice, and their findings will be compared with the radiology reports for each scan. They will then undertake further online assessments 3 and 6 months after the start of the study. Their overall results will be compared with a control group, who will undergo the same process, but undertake the online training after they have tried to interpret 30 scans in their clinical practice.

What are the possible benefits and risks of participating?
Participants will benefit from online training in the reporting of CT head scans, and will also receive £500 at the end of the study to compensate for their time. There are no obvious risks to undertaking the study, other than the time involved in participating. Participants will continue to base their clinical decisions on radiologist reports, not their own interpretations, so patient care will not be affected by this study.

Where is the study run from?
Oxford University Hospitals NHS Foundation Trust (UK)

When is the study starting and how long is it expected to run for?
December 2021 to June 2026

Who is funding the study?
Small Business Research Initiative (SBRI) (UK)

Who is the main contact?
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Contact information

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Additional identifiers

ClinicalTrials.gov (NCT)
NCT05427838

Integrated Research Application System (IRAS)
310995

Central Portfolio Management System (CPMS)
52221

Study information

Scientific Title
STEDI 2: Simulation Training in Emergency Department Imaging 2

Acronym
STEDI 2

Study objectives
Can online simulation/training have an impact on the reporting accuracy of Emergency department doctors when interpreting CT head scan images?

Ethics approval required
Old ethics approval format

Ethics approval(s)
1. Approved 24/03/2022, Health Research Authority REC (Skipton House, 80 London Road, London, SE1 6LH, UK; +44 (0)20 7972 2545; hra.approval@nhs.net), ref: 22/HRA/0743
2. Approved 29/03/2022, Oxford University Medical Sciences Interdivisional Research Ethics Committee (MS IDREC, Research Services, Research Governance, Ethics & Assurance Team, University of Oxford, Boundary Brook House, Churchill Drive, Headington, Oxford, OX3 7GB, UK; +44 (0)1865 616575; leah.butts@admin.ox.ac.uk), ref: R80145/RE001

Primary study design
Observational

Study design
Prospective observational cohort study

Study type(s)
Other

Health condition(s) or problem(s) studied
Clinicians of varying seniority who request CT head scans as part of their routine clinical practice

Interventions
This is a prospective observational cohort study to assess the improvement in the image interpretation accuracy and confidence of reporters using online simulation training for CT head scan interpretation. Participants will be randomised to control (see section below – no online

training, 30 clinicians, 6 from each site) versus intervention (online training – 150 clinicians) groups. Prior to the start of the study, each participant ID will be randomised to either group in a 1:5 ratio via simple randomisation using an online number generator – the outcome of this allocation will be recorded on a linkage document held by the central study team in Oxford. To minimise bias in recruiting, site Principal Investigators will be unaware of their overall site allocations, but as each participant at their site is enrolled, they will contact the central study team to find out to which group the participant has been allocated.

Intervention Group:
The trial participants will be required to complete a baseline assessment where users will review a set of scans and provide a diagnosis before submitting the case. Once the baseline assessment is completed, users will have access to training cases where they were provided with the correct answers once they had attempted the case. Once the training was completed, the users will be asked to complete a second assessment. The improvement in diagnostic accuracy pre- and post-training will be measured.
Once the ED staff have been trained, they will be asked to evaluate a minimum of 30 CT scans each during their clinical shifts over a 3-month period. They will be asked to record their scan interpretation, the time the scans were performed, and the time they reviewed the scan. They will also be asked to retrospectively document admission details for the case (i.e., date and time of attendance and discharge of the patient), the findings of the standard clinical radiology report, and the time it was issued. The standard clinical radiology report will be considered to be the reference standard for diagnosis. This will allow us to measure the real-world accuracy of ED staff at interpreting CT heads. In addition, the researchers will also be able to measure potential time saving by ED staff interpreting the scans, by comparing the time of the ED clinician compared with the radiology report being issued. At the end of the month period, they will repeat the online assessment to assess their performance, and again after a further 3 months to assess their retention of any improvement in reporting performance.

Control Group:
To provide a control for comparison as to the relative benefits of the online training phase and the clinical interpretation phase in terms of improving reporting performance, 30 participants (6 clinicians from each site) will be randomised to undertake the clinical interpretation phase prior to the training module.

Survey:
After each assessment module, participants will be asked to complete an online survey asking questions about the study and how confident they feel about their interpretation accuracy.

Statistical Analysis:
1. Baseline accuracy statistics from each participant will be compared to subsequent results from each stage of the study
2. Accuracy statistics will be compared with those of Radiology Consultants and Registrars

Intervention Type
Behavioural

Primary outcome(s)
Accuracy of ED clinicians in reporting non-contrast CT head scans (sensitivity and specificity) measured using online assessment at pre/post-training, 3 months, 6 months post-training

Key secondary outcome(s)

1. Confidence of ED clinicians in reporting non-contrast CT head scans measured using self-reported confidence scores at pre/post-training, 3 months, 6 months post-training
2. Time difference between ED clinician interpretation and final radiology report measured using recorded report times at 3 months post-training
3. Real-world diagnostic accuracy of ED staff at interpreting medical imaging (sensitivity and specificity) measured using comparison of ED findings versus radiology report findings (reference standard) at 3 months post-training
4. Ability of clinicians to retain newly acquired CT reporting skills measured using online assessment at 6 months post-training
5. Factors that influence clinicians' reporting accuracy (abnormal finding, size of abnormality, image quality, rotation/position, other abnormalities present) measured using online assessment pre- and post-training
6. Factors affecting the uptake of new image reporting roles in the ED clinical population measured using a participant survey at 6 months post-training
7. Potential clinical and health economic impact of introducing CT head reporting into ED clinical practice measured using health economic modelling based on the difference between ED and radiologists report times during the clinical phase
8. Clinicians' interpretation accuracy with and without undergoing online training (sensitivity, specificity) measured using online assessment at pre-training/clinical phase, 3 months, 6 months post the start of the study

Completion date
30/06/2026

Eligibility

Key inclusion criteria
1. Emergency department clinicians who review CT head scans as part of their clinical practice
2. Working in the relevant ED during the clinical phase of the project

Participant type(s)
Health professional

Healthy volunteers allowed
No

Age group
Adult

Sex
All

Total final enrolment
294

Key exclusion criteria
1. Previous formal postgraduate CT reporting training
2. Previous career to registrar level in radiology/neurosurgery
3. Staff in Emergency Department post for less than 4 months

Date of first enrolment
20/04/2022

Date of final enrolment
31/05/2022

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Oxford University Hospitals
John Radcliffe Hospital
Headley Way
Headington
Oxford
United Kingdom
OX3 9DU

Study participating centre
Horton Hospital (branch)
Horton General Hospital NHS Trust
81a Oxford Road
Banbury
United Kingdom
OX16 9AL

Study participating centre
Milton Keynes General Hospital
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Eaglestone
Milton Keynes
United Kingdom
MK6 5LD

Study participating centre
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Mandeville Road
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United Kingdom
HP21 8AL

Study participating centre
Wexham Park Hospital
Wexham Street
Wexham
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SL2 4HL

Study participating centre
Royal Berkshire Hospital
Royal Berkshire Hospital
London Road
Reading
United Kingdom
RG1 5AN

Sponsor information

Organisation
Oxford University Hospitals NHS Trust

ROR
https://ror.org/03h2bh287

Funder(s)

Funder type
Government

Funder Name
Small Business Research Initiative

Results and Publications

Individual participant data (IPD) sharing plan

The data-sharing plans for the current study are unknown and will be made available at a later date

IPD sharing plan summary

Data sharing statement to be made available at a later date

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	version 2.0	01/04/2022	11/04/2022	No	Yes
Protocol file	version 2.0	01/04/2022	11/04/2022	No	No