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Testing an artificial intelligence hospital appointment management system

Submission date 29/09/2021	**Recruitment status** No longer recruiting	[X] Prospectively registered [_] Protocol [_] Statistical analysis plan [X] Results [_] Individual participant data
Registration date 29/10/2021	**Overall study status** Completed	
Last Edited 27/08/2025	**Condition category** Other	

Plain English summary of protocol

Background and study aims
Managing appointments is a significant challenge to healthcare providers and patients, with a high percentage of appointments being missed, resulting in patients not receiving treatment and provider capacity being wasted. Technology for improving appointment utilisation attendance, such as DrDoctor, has been developed which use artificial intelligence to address these issues. This study aims to evaluate fully the effectiveness of this technology. This will inform future judgements about the use of this technology by public health care providers.

Who can participate?
Patients receiving secondary care (outpatients) at Nottingham University Hospital NHS Trust and Guy's and St Thomas' NHS Foundation Trust, aged 18 years or over, capacity to/and consent, receiving treatment within at least one of the following care streams: ophthalmology (glaucoma), renal, oncology (colorectal).

What does the study involve?
Participants will be contacted by the project team and asked to complete a series of questions (online, over the telephone or via post – as you prefer), which take about 15 - 20 minutes to complete, where they will be asked about their general health and their satisfaction with how their appointment bookings are managed. There will be 60 questions, which will ask about expenses, time taken getting to the hospital, how satisfied they feel with the appointment system, and some questions about health and wellbeing.

What are the possible benefits and risks of participating?
There will be no direct benefit from taking part in the study, but the participants' experience and feedback will help to make a decision about the appointment system; if it is safe and effective to use widely in the NHS. The project team do not foresee any risks of taking part in the study, but if participants feel they may be at risk in any way, the team will chat with them and decide on an appropriate course of action (if necessary).

Where is the study run from?
London South Bank University (UK)

When is the study starting and how long is it expected to run for?
April 2021 to December 2023

Who is funding the study?
NHS England/X (UK)

Who is the main contact?
Prof. Nicola Thomas
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Study website
https://www.lsbu.ac.uk/research/centres-groups/applied-research-improvement-innovation-health-social-care/evaluation-nhs-appointment-management-system

Contact information

Type(s)
Scientific

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Additional identifiers

EudraCT/CTIS number
Nil known

IRAS number
301143

ClinicalTrials.gov number
Nil known

Secondary identifying numbers
IRAS 301143

Study information

Scientific Title
A pragmatic trial of an Artificial intelligence DRiven appOInTment maNagEment SyStem (ADROITNESS)

Acronym
ADROITNESS

Study objectives
The trial will test the intervention (DrDoctor) for superiority on cost and efficiency outcomes, and non-inferiority on clinical outcomes. The null hypothesis is that no observable treatment differences will be detected.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 17/06/2022, London - Fulham Research Ethics Committee (Barlow House, 3rd Floor, 4 Minshull Street, Manchester, M1 3DZ, UK; +44 (0)207 104 8084, +44 (0)207 104 8035, +44 (0)207 104 8109; fulham.rec@hra.nhs.uk), ref: 22/LO/0130

Study design
Multicenter comparison trial utilising between-site comparators (site receiving no intervention) and within-site comparators

Primary study design
Interventional

Secondary study design
Non randomised study

Study setting(s)
Hospital

Study type(s)
Treatment

Participant information sheet
See study outputs table

Health condition(s) or problem(s) studied
Improving appointment attendance in patients attending secondary care

Interventions
The project is evaluating a new way of organising appointments, using an intervention /technology called DrDoctor.

DrDoctor is designed to reduce the number of missed appointments by providing regular electronic reminders; ways to rearrange appointments and linking appointments, for example making sure that blood tests are available before an appointment to see a doctor or a nurse. You can read more about it at https://www.drdoctor.co.uk/.

The researchers are looking to see if the new technology for organising appointments is accurate, safe, effective and takes the needs of patients into account. They are doing this by comparing hospitals that use DrDoctor with those that do not.

This study comprises a pre/post-deployment comparison trial utilising between site comparators (site receiving no intervention) and within site comparators (comprising data from 3 months prior to deployment and 6 months post-deployment). A 2-month period immediately following deployment is excluded from data-collection/evaluation to ensure the intervention/technology (DrDoctor) is functioning correctly and any emerging deployment issues are resolved. To account for service impacts caused by COVID, Trust data will also be used from the 3 months of October to December 2019. These dates were chosen because they were the 3 months prior to the COVID lockdown.

The trial will test for superiority on cost and efficiency outcomes, and non-inferiority on clinical outcomes. The null hypothesis is that no observable treatment differences will be detected.

Primary analysis (direct from participant data)

A total sample of 900 people will be sampled from a single intervention site (n=450) and a comparator site (n=450), divided equally between the three specialities (renal, ophthalmology, oncology).

Intended timelines: In both arms, baseline participant data will be collected pre-deployment of DrDoctor (n=225) and 6 months post-deployment (n=225). Pre-deployment data collection will begin in February 2022 (for 3 months). DrDoctor will be deployed in May 2022. Data collection for the post-deployment phase will take place in November 2023. Completion of data analysis and report preparation should be completed by February 2024.

All patients within the specialist streams, using the selected NHS Trusts (Nottingham University Hospitals NHS Trust and Guy's and St Thomas' NHS Foundation Trust), during the study period, aged 18 years or over are eligible for inclusion. Patients identified by the clinical research network/research team will be provided with information detailing the study and will be asked to sign a consent form. This will be done face-to-face (participant information sheet or leaflet) or electronically. Patients will then be asked to complete pre-deployment questionnaires measuring demographics, economics, mental health, physical health and satisfaction with service. Six months post full deployment of DrDoctor, a new cohort will be contacted, using the same recruitment method, to complete the same measures. The aim is for participants to complete these online using Qualtrics (a data collection platform). For those without email or who wish to complete the measures on paper, copies will be sent to them with a pre-paid return envelope.

Intervention Type
Other

Primary outcome measure
Number of Did Not Attends (DNAs) and number of unused appointments measured using Trust data at baseline (3 months prior to deployment of DrDoctor) and at 6-months post-deployment

Secondary outcome measures
1. Adverse physical health events measured using a single item at baseline and 6 months
2. Patient mental health measured using Generalised Anxiety Disorder 7 (GAD-7) and Patient Health Questionnaire (PHQ-8) at baseline and 6 months
3. Patient satisfaction measured using study generated scale at baseline and 6 months
4. Physical health measured using EQ5D-3L at baseline and 6 months
5. Economic evaluation measured using CSRRI at baseline and 6 months

Overall study start date
01/04/2021

Completion date
01/12/2023

Eligibility

Key inclusion criteria
Patients:
1. Receiving secondary care (outpatients) at intervention/comparator sites
2. Aged 18 years or over
3. Capacity to/and consent
4. Within one of the following care streams: ophthalmology (glaucoma), renal, oncology (colorectal)

Participant type(s)
Patient

Age group
Adult

Lower age limit
18 Years

Sex
Both

Target number of participants
900

Key exclusion criteria
Patients:
1. Not receiving secondary care within at least one of the three selected specialities (ophthalmology, oncology, renal)
2. Aged below 18 years
3. Not attending the named intervention/comparator site
4. Unable/unwilling to consent

Date of first enrolment
01/08/2022

Date of final enrolment
01/11/2023

Locations

Countries of recruitment
England

United Kingdom

Study participating centre
Nottingham City Hospital
Hucknall Road
Nottingham
United Kingdom
NG5 1PB

Study participating centre
Guys Hospital
Great Maze Pond
London
United Kingdom
SE1 9RT

Study participating centre
St Thomas' Hospital
Westminster Bridge Road
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Sponsor type
University/education

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ROR
https://ror.org/02vwnat91

Funder(s)

Funder type
Government

Funder Name
NHS England/X (AI Health & Care Award Technology Specific Evaluation Teams)

Results and Publications

Publication and dissemination plan
Planned publication in peer-reviewed scientific journals, internal reports and conference presentations. The researchers plan to write a protocol paper in the next few months and will seek publication in a peer-reviewed journal and/or make it available via the OSF and ISRCTN.

Intention to publish date
01/02/2025

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study will be stored in a repository. The data will be held for 5 years for the purposes of verification by other research teams. It will be held by the research team and available on request. Consent will be obtained for this direct from participants.

IPD sharing plan summary
Stored in repository

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	version 2		14/10/2021	No	Yes
HRA research summary			28/06/2023	No	No
Other files	Executive summary		27/08/2025	No	No
Results article		17/06/2025	27/08/2025	Yes	No