Ophthalmology Diagnostic Hubs A case Study

Moorfields Eye Hospital NHS Trust

January 2021

Moorfields Eye Hospital NHS Foundation Trust

NHS

Contents

1. Background

Moorfields Eye Hospital NHS Foundation Trust is responsible for eye care services across a network of sites across London and Bedfordshire. We provide a networked system that delivers the most specialised eye care; world leading research; emergency eye care services accessible to all of London; and high volumes of diagnostics, outpatients and surgery. We provide approximately 42% of London's hospital delivered ophthalmology activity.

For many years prior to COVID, we have been leading on ophthalmic services transformation. Pre-COVID, Moorfields had already established diagnostic or 'tech-led' clinics in both glaucoma and medical retina. The trust had undertaken work to review how to increase the proportion of patients in diagnostics-only clinics to support the NHS Long Term Plan ambitions of delivering new service models in optimal care settings, giving patients more options and implementing digitally enabled care wherever possible. We had been investigating models for diagnostic hubs, high volume surgical centres and high volume multi-professional injection services and systems. The development of offsite diagnostic hubs has been fast tracked due to the pandemic and demonstrates the importance of building on what has been shown to work with pilot clinics and proof of concept programmes.

Our strategy is to consider the place of standardisation and reduce unwarranted variation, for system efficiency, and to be innovative and implement digital first pathways where possible, taking into account regulatory commitments and patients' expectations.

This report will focus on the set-up of an external diagnostic hub and the planning which led to this development.

1.1 Moorfields trust structure

Below is a diagram showing Moorfields network of sites:

	n	Site	Div	Type
	1	MEH City Road	CR	A
	2	Balham Health Centre	S	C
	3	Barking Hospital	N	C
	4	Bedford Hospital (N)	N	C
	5	Bedford Hospital (S)	N	A
	6	Brocklebank Health Centre	S	C
	7	Croydon University Hospital	S	A
	8	Ealing Hospital	N	A
	9	Homerton Hospital	N	D
	10	Mile End	N	B
	11	Nelson Health Centre	S	C
	12	Nightingale Nursing Home	S	C
	13	Northwick Park Hospital	N	A

	n	Site	Div	Type
	14	Parkway Health Centre	S	C
	15	Potters Bar Community Hospital	N	B
	16	Purley War Memorial Hospital	S	C
	17	Queen Mary's Hospital	S	B
	18	Sanderstead Health Centre	S	C
	19	Sir Ludwig Guttman H&WC	N	C
	20	St Ann's Hospital	N	B
	21	St Bartholomew's Hospital	N	B
	22	St George's Hospital	S	A
	23	Tooting Bec Medical Centre	S	C
	24	Watford General Hospital	N	C
	25	Henry Morgan opticians	N	D

Moorfields Eye Centres (District Hubs)	Moorfields Eye Units (local surgical centres)	Moorfields Community Eye Clinics (outpatient)	Partnerships and networks
A	B	C	D

Within our geographical network, care is generally sub-divided into four different types of service, ensuring a comprehensive range of eye care provision closer to patients' homes:

- **Moorfields eye centres (district hubs):** co-located with general hospital services, our eye centres provide comprehensive outpatient and diagnostic care as well as more complex eye surgery and will increasingly serve as local centres for eye research and multidisciplinary ophthalmic education
- **Moorfields eye units (local surgical centres):** our eye units provide more complex outpatient and diagnostic services alongside day-case surgery for the local area
- **Moorfields community eye clinics (community-based outpatient clinics):** these clinics focus predominantly on outpatient and diagnostic services in community-based locations
- **Moorfields partnerships (partnerships and networks):** in this model, Moorfields offers medical and professional support and joint working to eye services managed by other organisations; we also provide clinical leadership to various diabetic retinopathy screening services and to networks across London that deal with retinopathy of prematurity.

General attendance figures:

The pre-COVID annual activity was:

- 783,788 outpatient attendances
- 95,523 urgent or A&E attendances
- 44,922 surgeries

1.2 Moorfields initial response to the COVID lockdown and baseline position

Following the announcement of the nationwide lockdown in March 2020, all elective care across London was suspended. Moorfields Eye Hospital had to cancel more than 5 months of routine activity across outpatients. As part of our COVID response, Moorfields established a trust-wide risk stratification approach, which meant that high risk patients were seen but medium & low risk patients were postponed. The biggest subspecialties affected were glaucoma and medical retina (MR). This created an inherent potential risk relating to sight loss if these patients could not be seen quickly once services restrictions were lifted. Therefore, the recovery plan and longer-term transformation focussed on developing high volume diagnostics-only "digital" clinics with asynchronous virtual clinical review to make the clinical decision based on the data, to maximise the throughput and ensure that patients would be seen in as timely a way as possible.

Glaucoma

- Moorfields sees over 60,000 glaucoma patients each year, greater than 116,000 appointments
- The glaucoma service began running a stratified model of care in November 2017 with one site providing 12 sessions per week optometrist- and technician-delivered diagnostics and care supported by virtual decision-making.
- Pre-COVID, in January 2020, 14% of glaucoma patients were being seen in 10 inled technician-led diagnostics-only clinics per week.
- As part of the COVID response, a plan was created to temporarily move up to 85% of patients out of face to face clinics, with a longer-term goal of re-establishing services based on a three-tiered (diagnostics-only, optometrist-led or consultant-led) approach. The original percentage-based targets for each tier were assumption-only and were later revised based on clinical risk stratification, modelling and experience.

Medical Retina

- The MR service sees over 140,000 attendances a year, of which more than 77,000 appointments are in the central City Road site.
- Pre-COVID, only approximately 5% of MR attendances were in diagnostics-only clinics.
- As part of the COVID response, the pilot diagnostic hub now sees 250-300 MR patients per week in a safe and socially distanced model.
- In a recent audit (1638 appts), this model has proven safe and effective, with only 6% of cases requiring an urgent face to face review within 2 weeks.

2.0 Initial steps and planning

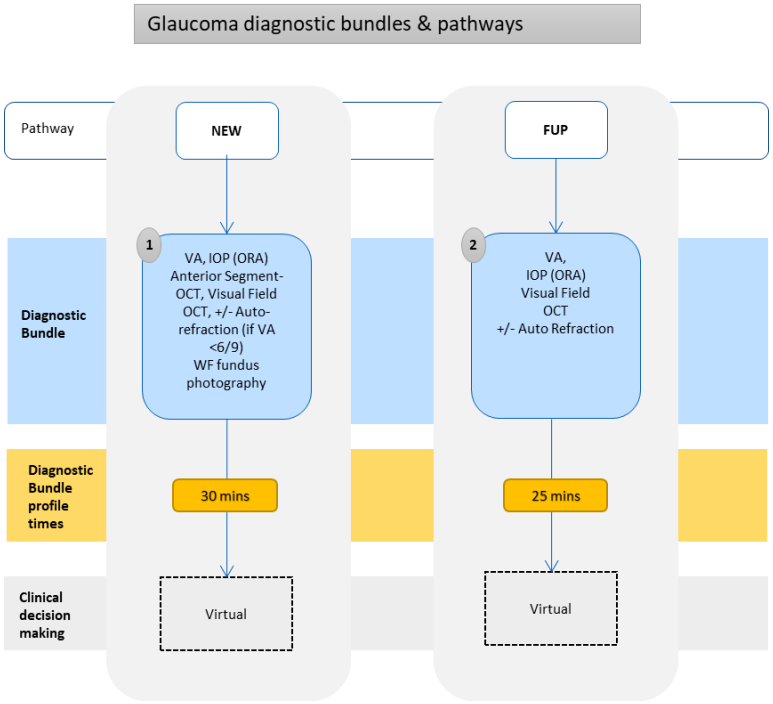
2.1 Risk stratification

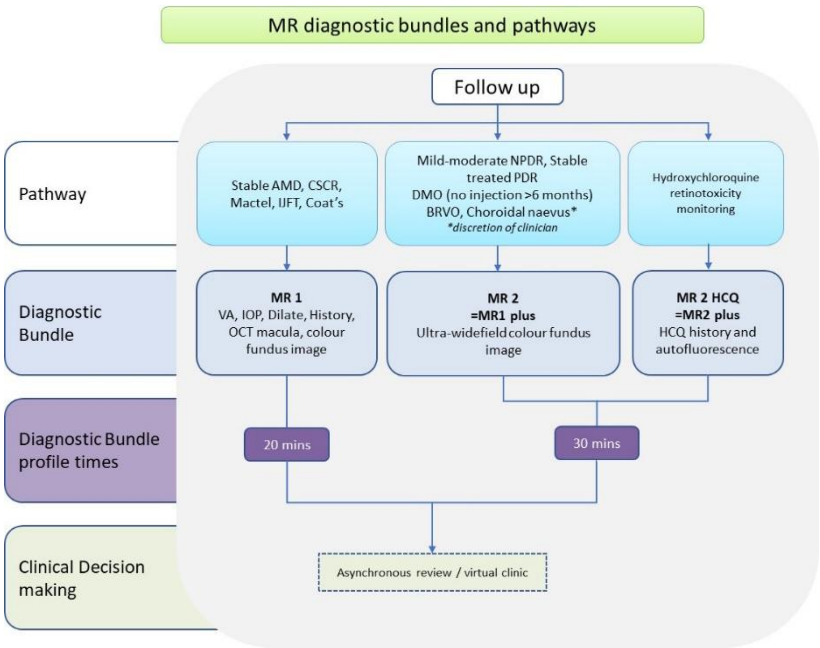
As part of our COVID response, Moorfields established a trust-wide risk stratification approach across all sub-specialties, which was later adopted by the RCOphth. Whilst clinics were suspended, clinicians reviewed patient notes and categorised patients. From this, patients suitable for diagnostic pathways were identified.

In addition to clinical risk stratification, work was undertaken to create a dynamic dashboard to prioritise patients according to clinical risk, waiting time, and previous interventions, to further support planning efforts.

2.2 Develop a safe and effective diagnostic pathway

The glaucoma service had a well-established 3 tier service delivery model prior to COVID-19 which was based on risk stratification and disease severity. This was expanded in response to the pandemic and subsequent suspension of services.





Both the glaucoma and MR services came to a clinical consensus at service level on the 'bundles' of diagnostic testing required for each pathway. The glaucoma service diagnostic bundles followed the previously established technician-led service model which utilises a standard set of diagnostic tests irrespective of the patient's disease severity type or sub-classification of glaucoma, the only difference relates to whether the patient is new to the service or a follow-up patient. The MR service developed 3 discrete diagnostic bundles which relate to disease severity and sub-classification.

2.3 Delivering a new workforce

A streamlined recruitment and training programme was developed to build up a multi-skilled workforce for these diagnostic pathways. A new generic technician job description was developed to allow for flexible rotation across the network. Our HR team, working with our recruitment partners, developed a new recruitment process which included an assessment centre to determine customer service skills, values and behaviours, as well as testing technical skills with a short practical assessment.

Once appointed onto a fast track recruitment pathway, the successful candidates enter a "boot camp" training week which is a structured learning programme. The programme begins with on-boarding, mandatory and statutory training, online clinical and technical modules and concludes with hands-on training with Industry Partners. For the following 2 months the technicians are provided with on-going supervision, where they will be supported to complete a log book, summative and informative competency assessments, participate in case-based discussion and final competency sign-off, when they can deliver protocol-driven diagnostics with minimum supervision.

The Fundamentals of Ophthalmic Assessment. Ophthalmic and Vision Science Level 3 (OVS3)

Recruiting Principles:

- Recruit differently - Work with a recruitment partner
- Use assessment centre, competency based interview, to assess customer service skills, a situational judgment test, based around 4 likely clinical scenarios and a practical technical assessment
- Training will be bespoke for diagnostic hubs (not outpatient clinics) with industry partners.

Programme developed by : Peter Holm, Shilpa Kotecha, Tendai Gwenhure, Richard Price Whittle, Adam Mapani, Gordon Hay and Kerry Tinkler.

Imaging review clinics were established from previous consultant or optometrist face to face clinics, with SOPs for each team established. A single clinic staffed with different clinical expertise using the same space (e.g. a reading centre) was suggested to maximise the number of reviews per session, in order that a consultant can oversee and support the team of junior doctors, optometrist and graders in decision-making. Where possible and space allows, some teams have implemented this. Others have set this up in one of the Moorfields sites with connectivity and data transfer capabilities or implemented virtual reviews from home (where technology and connections allow). The number of patients reviewed virtually per session is shown below:

	Patients reviewed per Session	Clinician
Glaucoma	20	Optom
	24	Consultant, Fellow,
MR 1	20	Consultant, Fellow,
	14	Optom or Grader
MR2	16	Consultant, Fellow,
	10	Optom or Grader

2.4 Defining clinic capacity, scheduling and flow

Following agreement on the diagnostic bundles, modelling was undertaken using time and motion data to calculate the diagnostic bundle times. Allowing calculation of theoretical clinic capacity and scheduling as below:

Clinic schedule = Total clinic length/diagnostic bundle time*****

**80th centile for time and motion data was used to offer flexibility in the calculations to account for variability in patient ability and test times.*

Additionally, work was rapidly undertaken at the start of the CVOID pandemic to assess the infection control measures required to safely sterilise equipment after use, and this time was added to the diagnostic tests to be more reflective of the true time of each test.

Based on initial flow modelling and outcomes from the current sites up and running, a capacity plan was set and this is outlined in the table below.

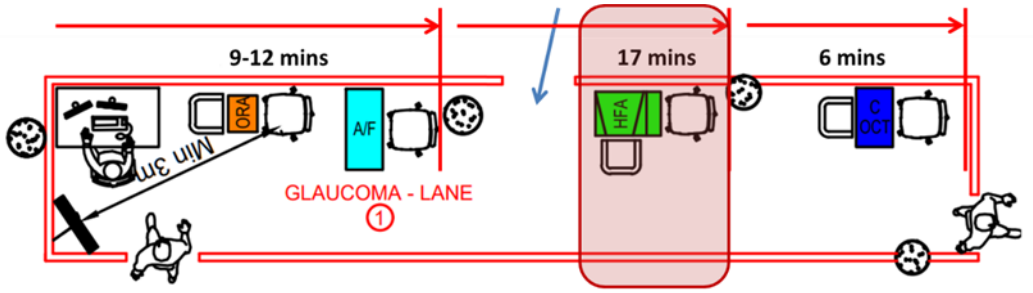
It was proposed to establish a scalable 6 lane hub (3 per specialty), with 4 hour sessions, and a minimum of 12 sessions per week, creating 600-700 patient slots per week, depending on the case mix of new and follow-up patients. Glaucoma patients would be booked every 20 minutes, MR patients booked every 20 minutes.

Appointment type	Number of patients per lane per session	Scheduling time (mins)	80th centile Journey time (mins)*	Ave journey time (mins)*
GL New	8	20	TBC	TBC
GL F/U	10	20	41	37
MR1	12	20	32	26
MR2	8	20	60	46

** Data taken from early preliminary pilots. We have since been able to show shorter journey time even with existing estate layout.*

Additionally, the scheduling and flow modelling was completed with the optimal equipment as identified by the clinical services. The scheduling is determined by the process bottleneck. This means that the minimum amount of time between patients (schedule) is equal to the longest process in the journey (functional bottleneck).

Staff access between lanes for supervision



Work was undertaken to identify the total capacity within the established system, including identifying current equipment, staffing and waiting room space in the context of social distancing. Calculators were produced utilising this base data, which was taken from workforce data, trust asset registers and local clinical knowledge as well as managerial site reports.

2.5 Reviewing demand

The clearance time for the patient backlog was then determined for each of Moorfields geographical areas and also by STP area, assuming existing theoretical capacity was maximised through an economies of scale 'lift and shift' approach, where equipment and staff would be relocated to produce the most efficient capacity available. This showed a long duration to full backlog clearance and the need to develop additional capacity.

Demand for diagnostic lanes was calculated both for backlog clearance (although this is continually shifting), as well as yearly "business as usual" demand. This could then be assessed against existing capacity to identify the need, both in the short term for backlog clearance, and in the long-term to move permanently to this model of care. Clinical risk criteria were used to identify not only which patients would be suitable for diagnostic appointments but also how many times per year they were likely to need to be seen.

Glaucoma

Assumptions used were:

- High risk patients seen 4 times/year
- Medium risk patients seen 3 times/year
- Low risk patients seen 1 times/year

Medical Retina

Assumptions used were:

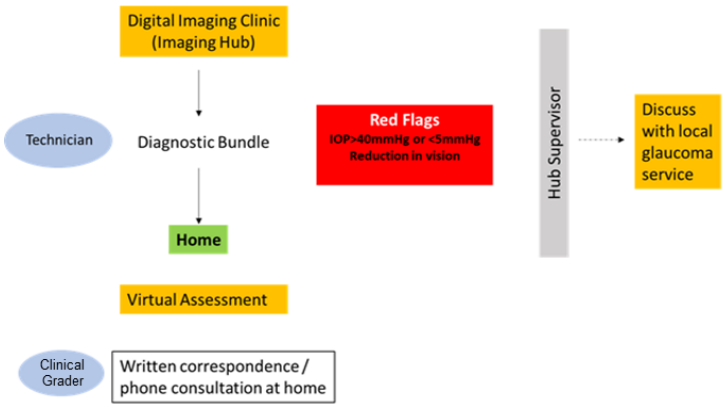
- High risk patients NOT seen in diagnostic hubs
- Medium risk patients seen 3 times/year
- Low patients seen 2 times/year

Patients suitable for diagnostic only clinics	Yearly Demand (appointments)	Weekly Demand	Diagnostic Lanes Required
GL New	14,857	291	2.4
GL FUP	107,333	2,105	17.5
MR1	23,503	461	4.3
MR2	48,706	955	8.8

2.6 Clinical governance to ensure safe and effective pathways of care

Prior to the go-live of the pilot, standard operating procedures were produced for both the glaucoma and MR diagnostic pathways to ensure good governance was in place and that clear escalation policies were available to support staff. Additionally, clear booking processes were set out with specific eligibility criteria to ensure the right patients were seen in the right clinic at the right time.

Glaucoma:

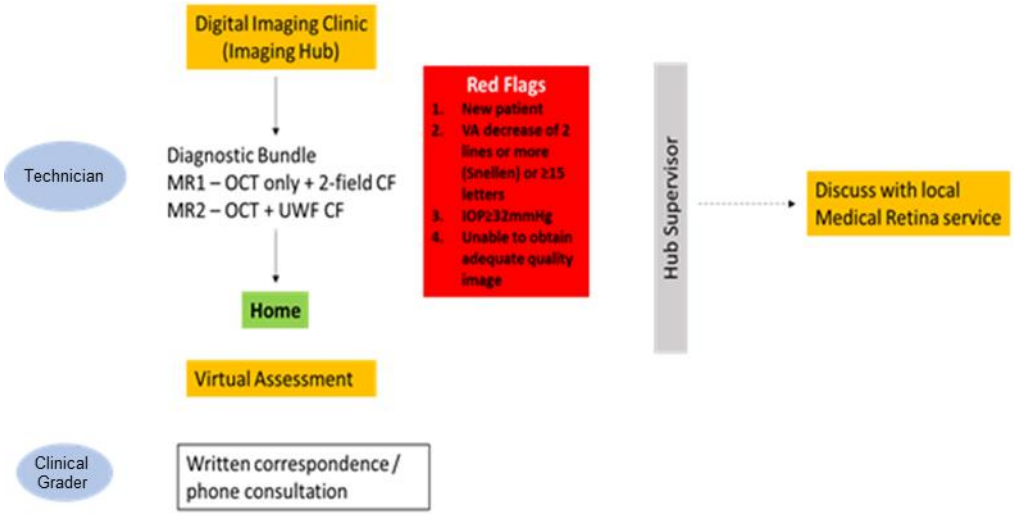


The following pathways were developed by clinical leads and key clinical stakeholders in the services and refined and signed off by the Service Directors.

Eligibility criteria	Exclusion criteria

• New referrals that have been scrutinised by a consultant
• Follow-up patients that have been scrutinised by a consultant
• Post glaucoma medication changes
• Post SLT reviews
• Ocular hypertension/glaucoma suspects
• Open angle glaucoma on medication
• Pseudophakic angle closure glaucoma on topical treatment
	• Previous glaucoma surgery
	• Frail patients / poor mobility
	• Post-op uncomplicated cataract surgery (community pathways not established)
	• Post LPI PAC(G)
	• Reduction in visual acuity (e.g. cataract)
	• Post-op cataract surgery in the presence of
	  ○ Functioning Bleb
	  ○ (Trabeculectomy/Xen/Preserflo)
	  ○ Advanced glaucoma
	  ○ Only eye
	• Patients with learning difficulties / potential lack of capacity

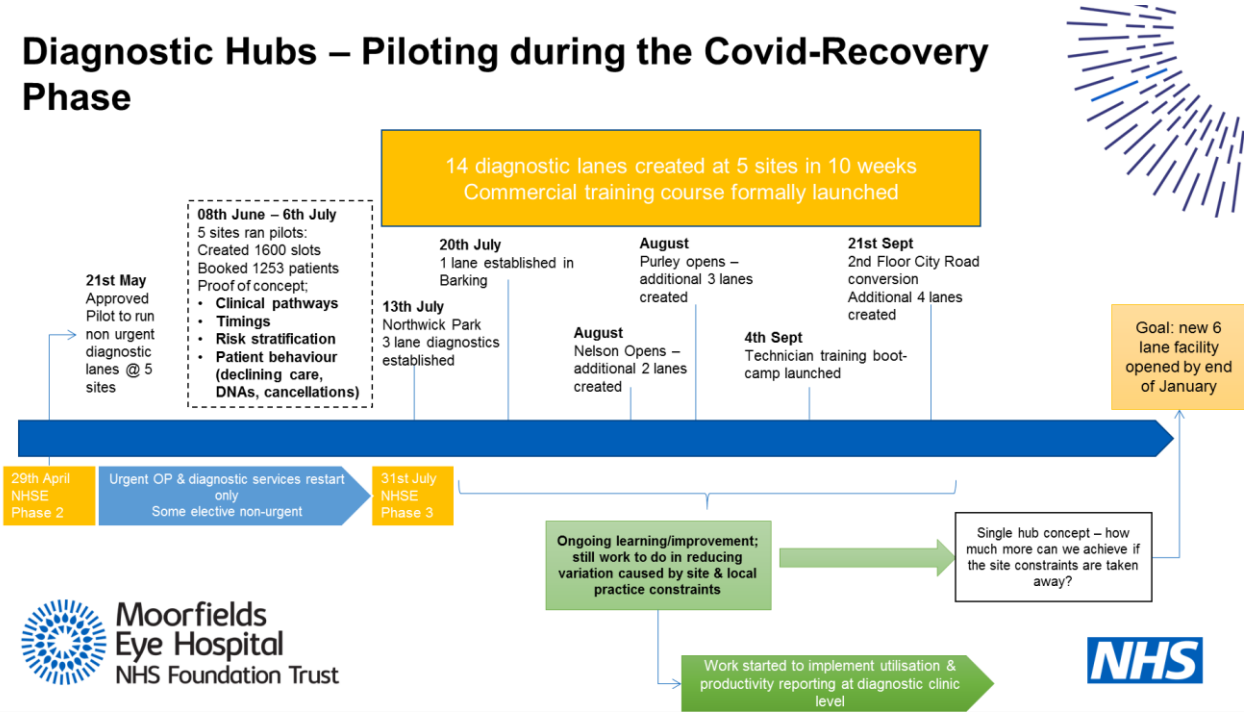
Medical Retina



Eligibility criteria	Exclusion criteria
• Mild to moderate NPDR ± DMO • Stable treated PDR – last PRP >12 months with evidence of regression post-PRP and stability • BRVO ± MO – no injection >6 months • Macroaneurysm • Other maculopathies – no treatment >6 months • Stable AMD • CSCR not requiring treatment • Hydroxychloroquine retinotoxicity monitoring • Choroidal naevus – at the discretion of the supervising consultant	• Patients with cognitive impairment/dementia • Dense cataract • Unmanaged narrow angle patients/risk of angle closure

3.0 Piloting the model in a clinical setting

Following the modelling, diagnostic pilot clinics were undertaken to assess the robustness of the model and also to identify any changes required, as well as ensuring the pathways delivered safe and effective outcomes for patients.



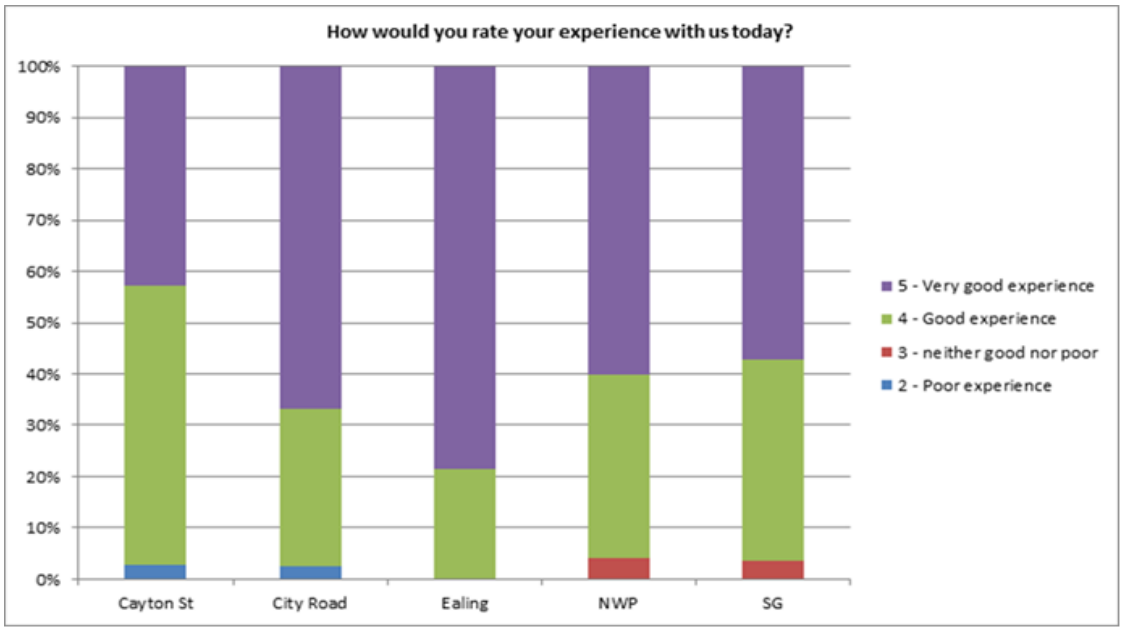
Pilot clinics for MR and glaucoma were run on 5 sites seeing medium risk patients. This was before the full restart of services, so small patient numbers were booked to trial ways of working so we were ready to restart and recover activity at the earliest opportunity.

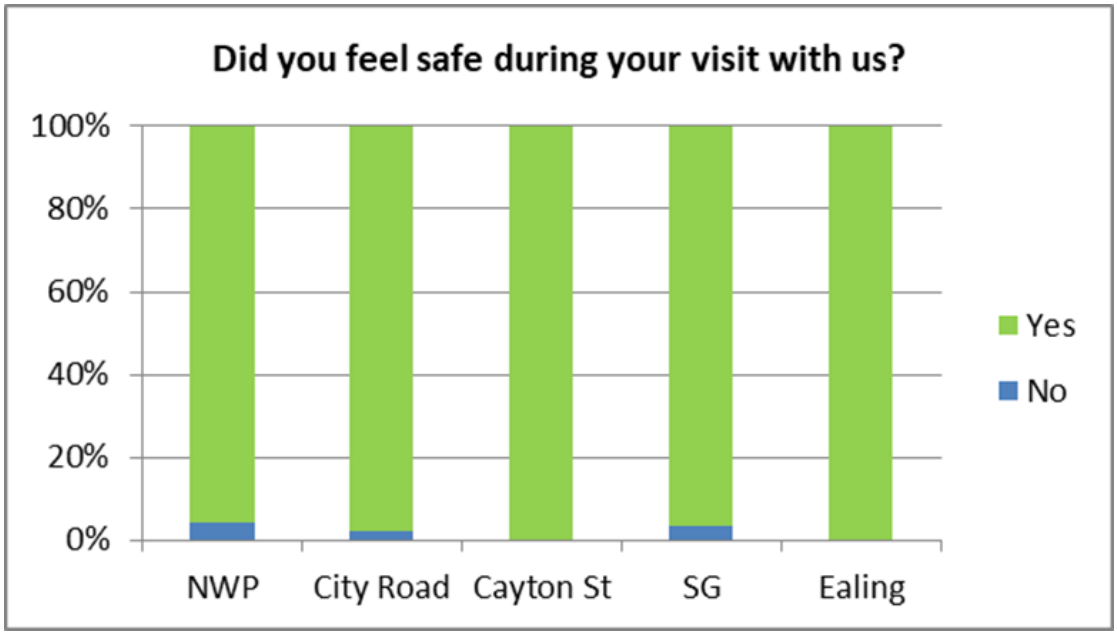
Below are some key operational metrics taken from the pilots:

- 1,253 patients booked in.
- 873 attended
- High did not attend (DNA) & cancellation rates – up to 30% at some sites
- High rate of patients declining appointments – mainly due to shielding, self-isolating or nervousness to come in.
- Patient in-clinic journey times were recorded and weekly improvements seen;
  Week 1, 60 minutes+, reducing to <40 minutes for most patients by week 4, reflecting staff getting used to new site layouts, flows and pathways.

3.1 Patient feedback

As well as evaluating the time and motion data, patient satisfaction questionnaires were used to ensure the quality of the service remained comparable with standard care models. The results of the patient experience questionnaires can be seen in the tables below.





Divisional Team	No of responses	Recommend to friends and family
City Road (Cayton St & City Rd	926	93%
North (Ealing & NWP)	122	95%
South (SG)	321	94%

4.0 A new Diagnostic Hub

4.1 Location and layout

Following the successful pilots in November 2020, Moorfields wished to establish a stand-alone diagnostic hub on a new site in central London, based on patient demand and geographical location/access. The objective of this hub was to:

- Increase capacity for diagnostic clinics for the glaucoma and MR services
- Support short-term backlog clearance following the cancellation of appointments due to COVID
- Contribute toward our long-term ambitions to change service delivery within our clinical model.

The new site will open in February 2021.

An initial list of 15 sites were identified based on geography and a basic site search. Of the 15 sites identified, 2 were dismissed owing to physical space constraints. The remaining list was refined to a shortlist of 6 based on how long it would take to set up the site.

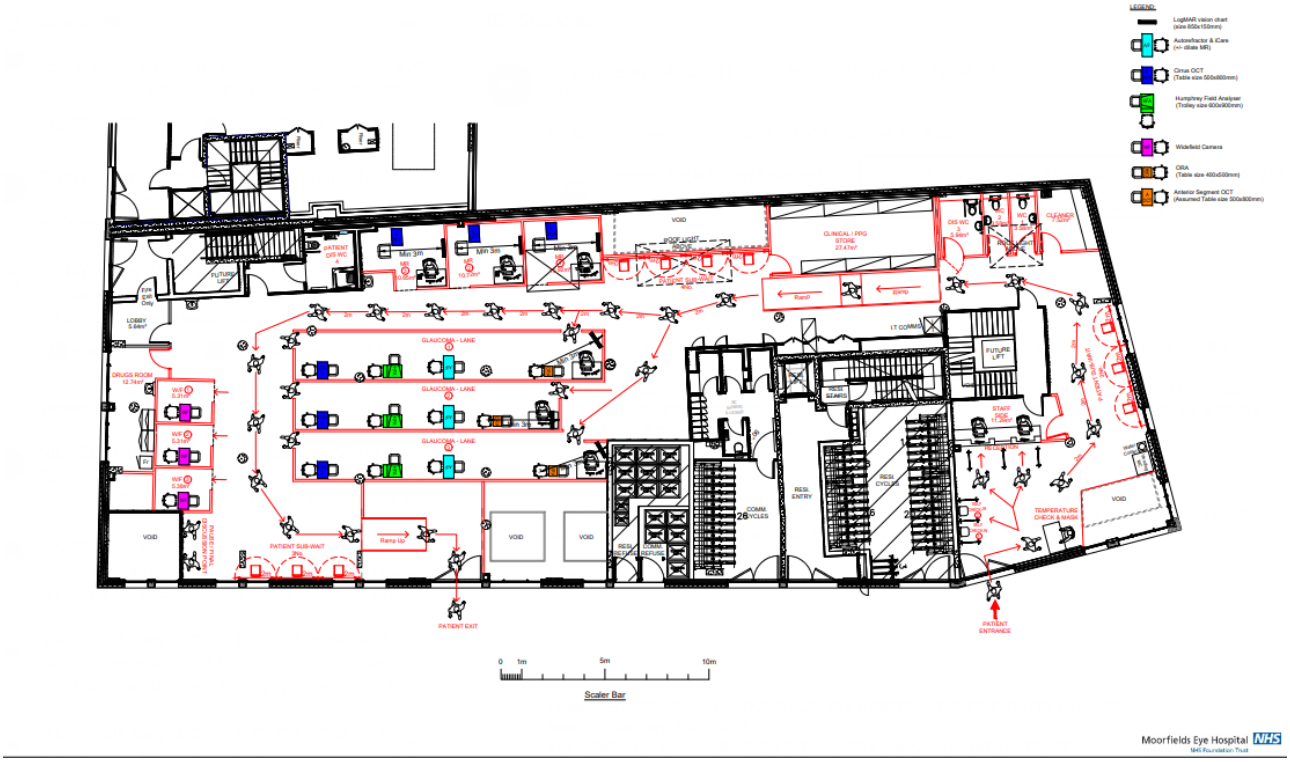
Site feasibility visits were undertaken in October 2020 for the 6 short-listed locations, to assess the most appropriate site to meet the requirements set out for a new diagnostic hub. The criteria (scored and weighted) included the following:

- Transport links - TFL accessibility (train/tube/bus)
- Cost of site (yearly rental)
- Estimated time to go-live
- Parking availability
- Size - can it deliver 6 lane hub (1000sqm) minimum requirement
- Number of patients in postcode district of the site
- Mobilisation - proximity to existing Moorfields sights to allow staffing and oversight.

On 24 November 2020, the Trust Management Committee (TMC) approved the business case to establish a six-lane standalone diagnostic hub on a new Moorfields site at Eagle Wharf Road, Hoxton, planned to open 1 February 2021. The Hoxton diagnostic hub is situated on the ground floor of the Eagle Warf Road building, located on Bracklyn Street. It is a new-build commercial property located 0.6 miles north of Moorfields main City Road site. The site has good local and national transport links.

Additionally, for private vehicles there is a single drop off bay outside the property and a pay and display parking facility with 15 bays available (10 mins walk)

The hub spans a total of 577.4 sqm and is comprised of 3 glaucoma diagnostic lanes with access to wide field diagnostic rooms, and 3 MR diagnostic bays with access to two wide field diagnostic room as shown in the floorplan below.

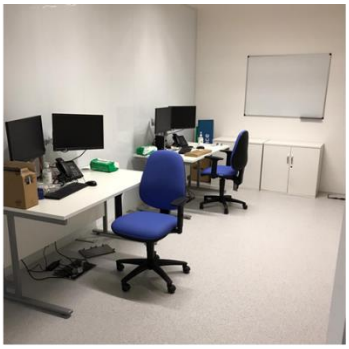


- The site has been configured to be as accessible as possible with step-free access, although the site is intended for ambulatory patients only. Internally, the partitioning between bays/lanes/rooms has been achieved with modular PVC panelling which can be moved and adjusted over time without impacting the need to make structural changes to the property.
- There is a small space for patients to wait adjacent to the reception desk as it is not envisaged that patients will spend much of the appointment waiting. This is to help minimise the number of people within the building (supporting social distancing, minimising contact time and potential viral load from respiration) and adhere to maximum building capacity while maintaining clinical efficiency.
- The Hoxton site has been assessed as part of the Building Research Establishment Environmental Assessment Method (BREEAM) and rated as Excellent (the second highest certification rating available).

Glaucoma Lane

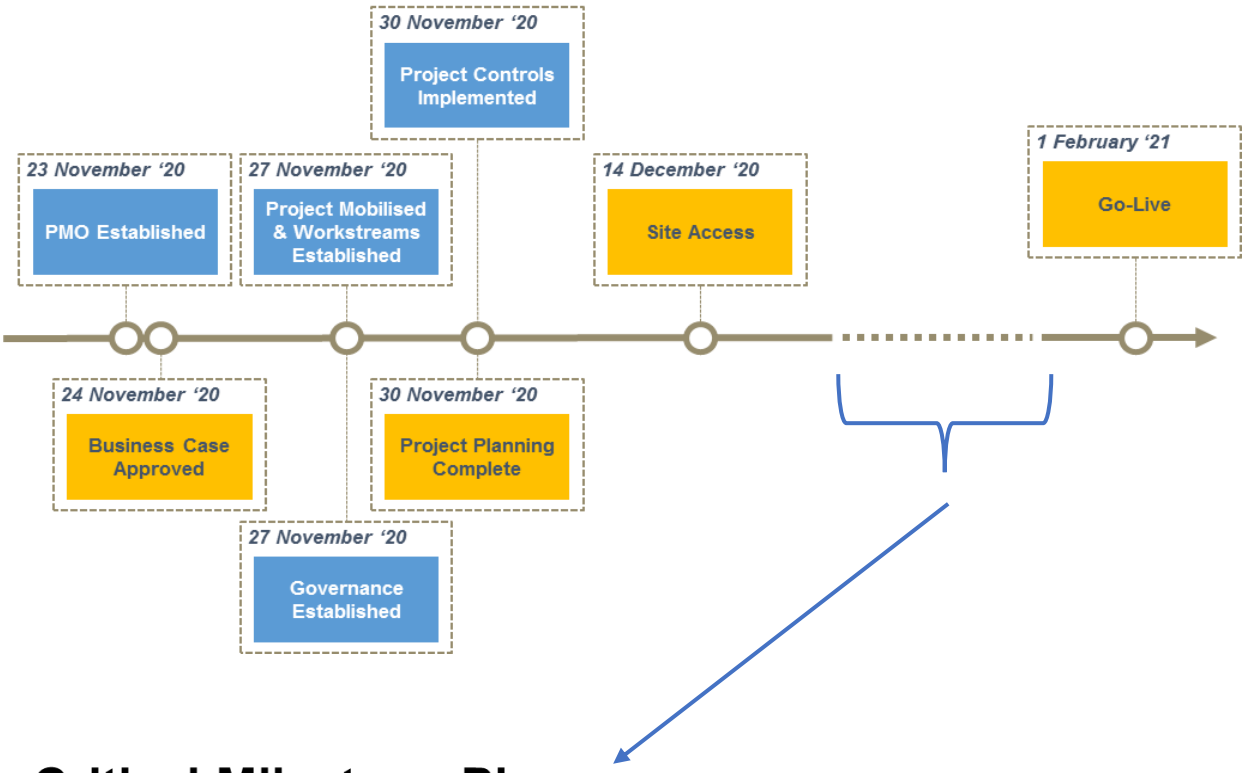
MR Room

Reception and staff areas



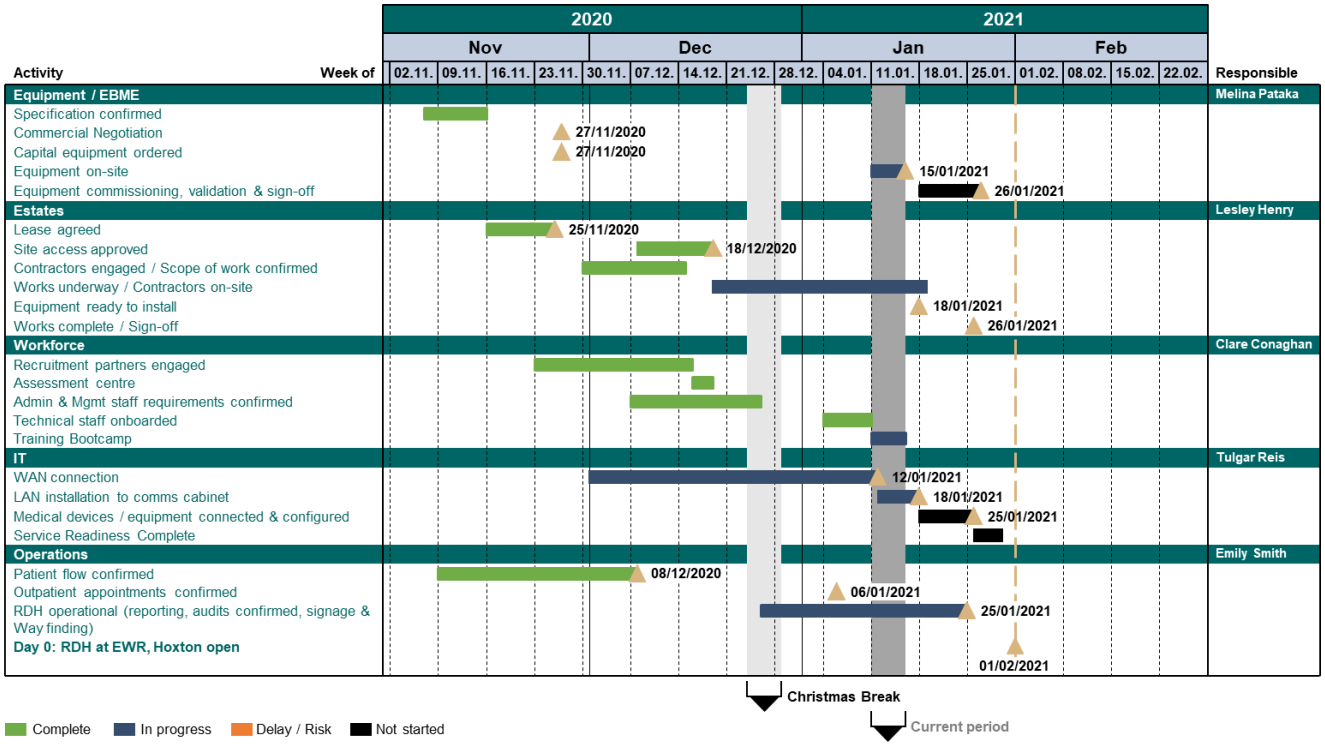
4.2 Implementation project plan

Project Activities



Critical Milestone Plan

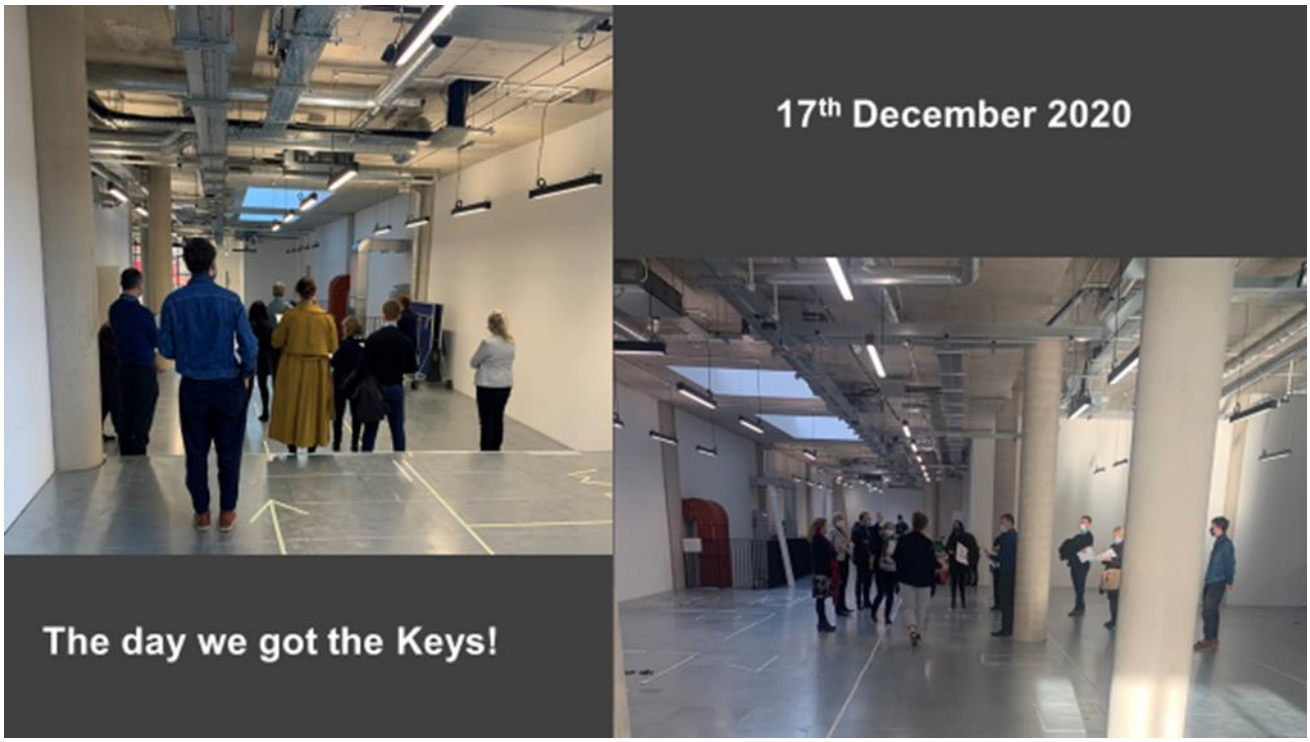
The plan below captures the status of critical milestones. SRO – Kerry Tinkler, PMO – Fraser Guillen
11/05/2021 – 15/01/2021



4.3 Implementation project governance

A Closer Look at Governance	
Group	**Responsibility**
Management Executive	• Commission project • Define project-level tolerances within which the Project Board will work.
Steering Group	• Overall direction and management of the project within constraints set out by Manex • Accountable for the success of the project. As part of directing the project, the board will: o Approve major plans and resources o Authorise any deviation that exceeds or is forecast to exceed tolerances o Approve the completion of each stage and authorise the start of the next stage o Communicate with other stakeholders.
Project Management	• Responsible for day-to-day management of the project within constraints set out by project board. • Primary responsibility is to ensure project produces required deliverables in accordance with time, cost, quality, scope, benefits and risk performance goals.
Project Delivery	• Workstream Leads and their teams, responsible for delivering the project outputs to an appropriate quality, within specified timescale and cost

Given the timeframes involved, a clear view of critical milestones and agreement of governance responsibilities has been instrumental in making progress.



4.4 Eligibility for hub services and care out of scope

Consultants and senior clinical decision-makers are not available on site and all review of diagnostic assessments are done asynchronously i.e. off-site on a different day.

Only MR and glaucoma services are offered at the hub and currently all other sub-specialities of ophthalmology are out of scope, although this will likely change going forward as other pathways are reviewed and evolve over time across sub-specialities.

Additionally, surgical and outpatient minor procedures are not being undertaken at this diagnostic hub. The demand for additional hubs is being scoped and may include diagnostic & treatment centres.

Eligibility/exclusion criteria for patients within glaucoma and MR services are as follows::

- Eligibility as per criteria outlined in the tables below.
- Non-ambulatory patients (these patients will continue to be seen at their usual network site or nearest site as appropriate)
- Patients with cognitive impairment (these patients will continue to be seen at their usual network site or nearest site as appropriate)

Medical retina patients suitable for the hub:

MR1	MR2
Follow-up 'old' CNVM	R3A PDR VH FU
Follow-up 'old' BRVO and CMO	R3A PDR - high risk
Follow-up Previously injected R1 DMO	R3A PDR low risk
Post op CMO - surgical intervention	R3A PDR post treatment
Macroaneurysm with VA <6/6	CRVO and CMO - FU
R1M1 DMO FU - not Previously injected <400 VA>6/9	M1 DMO FU - Previously injected - recent injection <2/12
CSR - new	R2 DMO FU - Previously injected
CSR - FU with fluid VA <6/9	R2 DMO FU - Previously injected
CSR - FU with fluid VA >=6/9	R3S DMO FU - Previously injected
Macroaneurysm with VA unaffected affected	R3S DMO FU - Previously injected
Mactel new	R2M1 DMO no injection but >400 VA >=6/9, SNPDR>Mod NPDR>Mild NPDR
Mactel FU	Coats/Retinal telangiectasia follow up
Inherited retinal disease (IRD) with CMO	R2M1 new
	R2M0 new
	R2 M0 old
	R1M0
	IRD with potential treatment options
	IRD old
	HCQ screen

Glaucoma patients suitable for the hub:

REMOTE MONITORING CLINIC	
New Patients	*Follow up Patients*

• All non-named referrals	• Consultant Review
	  ○ At consultant discretion
	  ○ Any type or severity of glaucoma
	  ○ Post GL medication changes
	  ○ Post SLT reviews
	• Optometrist Review
	  ○ OHT / Glaucoma Suspects
	  ○ OAG on drops
	  ○ Pseudophakic ACG on drops

4.5 Operations and service delivery Out of scope

4.5.1 Referral

- Patient referrals are triaged in the usual way by a member of the medical or optometry team responsible for referral scrutiny and the criteria above used to identify eligible patients for diagnostics-only hub appointments. Patients will be offered the most suitable appointment in regard to the eligibility criteria and availability of appointments.
- Patients are called by the booking team and verbally offered an appointment. If they agree to the appointment, a letter is sent confirming the appointment date, time and location. In addition, a pre-appointment information leaflet is sent outlining the process and clarifying that this is a diagnostics-only appointment. If patients decline, they are returned to the wait list and are contacted 4 weeks later to offer another appointment. If this second appointment is rejected their details are then passed on to the clinical team to review and decide how best to proceed.

4.5.2 Assessments

- Diagnostic assessments are carried out in accordance with the diagnostic bundles for the relevant clinical pathways.
- All patients will undergo the full test strategy for which they have been deemed suitable i.e. - all MR1 patients will have:
    - An ophthalmic history
    - Vision test
    - Eye pressure
    - Dilation
    - Macula OCT
    - Colour retinal photo
- The results are then stored and sent electronically via the trust EPR (OpenEyes) or proprietary digital image management platforms for that specific imaging modality e.g. Zeiss Forum.
- The results are reviewed by suitable qualified clinical teams including:
    - Consultant ophthalmologists
    - Speciality doctors
    - Optometrists
    - Graders.

4.5.3 Post assessment

Following the diagnostics visit, an asynchronous virtual review is undertaken by a clinical grader (consultant ophthalmologist, specialist trainee, non-medical grader or optometrist). A letter will be sent to the patient and GP with the results of all testing for patients whom have a ‘routine outcome’ i.e. all tests results are satisfactory. If a change in treatment is needed, or a decision needs to be

taken in consultation, this may be done over the telephone/Attend Anywhere video call with remote prescribing, to allow the patient access to the treatment without the need to travel to the hospital site. For those requiring urgent or interventional treatment, a face to face appointment may be booked at the time of review.

4.5.4 Hours of operation

The hours of operation at the Hoxton diagnostic site are outlined below:

- Mon-Sat 08:30am-5:00pm

Operating times will be reviewed as the COVID response develops.

4.5.5 Safety/Infection Prevention and Control

The following measures are in place to minimise the COVID risk to staff and patients:

- Staggered booking system
- Availability of hand sanitiser in key prominent points within the facility for ease of access to staff and patients
- Booking schedule set according to flow mapping to minimise delays and reduce overall journey time to a minimum
- There will not be any temperature testing of staff or patients on arrival to the diagnostic hub; however both staff and patients will be asked whether they are experiencing any associated symptoms on arrival and be provided a type 2 surgical splash proof mask
- 2m social distancing active within diagnostic hub at all times
- Type 1 PPE to be worn by staff when seeing patients to include:
    - type 2 surgical face mask
    - goggles
    - plastic apron
    - non-sterile gloves
- Cleaning of equipment will follow standard trust procedure unless an unwell patient is identified, for equipment this involves using anti-viral wipes of all patient contact points (chairs, equipment touch points etc.) between every patient
- Staff will be utilised across sites and will be tested according to the pathway they are working on for green/blue staff they will be in receipt of twice weekly PCR testing for other clinical staff lateral flow testing will be in place
- There will not be any COVID testing undertaken at the diagnostic hub, if patients are symptomatic they will be asked to follow standard public health England (PHE) advice relating to travelling, minimising contact and self-isolation
- There are no specific pre-visit requirements although patients will be required to follow current PHE national guidance
- Accompanying of patients is limited to only where absolutely necessary to support social distancing and minimise numbers within the building at any given time
- The hub will be closely monitored for appropriate air flow/exchange in line with all Moorfields sites.

4.5.7 Workforce

For any given session at the diagnostic hub, there are 14 band 3 technicians working at an operational level delivering face to face diagnostic assessments, one band 5 senior technician acting in a supervisory role to the band 3 staff and an off-site lead responsible for the overall service operations.

Additionally, there will be two reception staff to check patients in on arrival and complete all admin processes associated with the diagnostic hub clinics.

The site will run two 4 hour sessions, 6 days per week.

There will be no medical staff on site; however there will be 'on-call' representation for both sub-specialities to deal with any patients requiring escalation for advice and onward referral.

4.5.8 Equipment

Set out below is the equipment list:

Glaucoma lanes

- 3x Thomson software solutions VA charts
- 3x Zeiss VISUREF150 Autorefractor
- 3 x Reichert ORA
- 3 x Zeiss Humphrey VF HFA 3 series (860 model)
- 3x Zeiss Cirrus 6000 OCT
- 1x Zeiss Clarus 500

MR lanes

- 3x Thomson software solutions VA charts
- 3 x iCare
- 3x Spectralis HRA OCT 2
- 2x Zeiss Clarus 500

Other equipment:

- 8x Desktops or laptops for EPR entry and reception team
- 5x Desktops for office and touch-point office for administrative and professional activity purposes of technician staff

4.5.9 IT interoperability and connectivity and devices

The patient assessments are captured electronically through a combination of the trust EPR and vendor-specific imaging management platforms. History, vision, IOP and any general comments from the patient or technician will be captured on the trust EPR (OpenEyes).

For visual fields, OCT's and wide-field retinal photography, the data is saved and stored on vendor specific imaging management platforms as below:

Zeiss: The imaging management and transfer platform used is FORUM, to allow full manipulation and review of complete unaltered OCT's and viewing of visual field and autorefraction data as well as progression software as part of the vendor's core imaging management software.

Heidelberg: The imaging management and transfer platform used will be Heyex 2, again allowing full manipulation and review of complete unaltered OCT's.

Both platforms are accessible via licencing and allow review remotely between sites in real time, i.e. once uploaded the image can be reviewed immediately.

Patient booking: Patient bookings are managed using the existing trust patient administration system, (PAS Silverlink). All admin processes including check in and outcome are completed using this system.

The Hoxton IT infrastructure connects to the main Moorfields City Road infrastructure via secure HSCN, and there is therefore no requirement to acquire additional licensing, dongles or security provision as the new site is part of Moorfields existing IT infrastructure.

4.5.10 Clinical review of diagnostics

Patients receive an information leaflet prior to their diagnostic appointment and if they have any specific questions or concerns they can ask these at their diagnostic appointment. Any questions asked at the appointment are recorded by the technical staff and form part of the patients' electronic record and will be reviewed and addressed at the time of their asynchronous review (virtual appointment).

See 4.5.3. The clinician uses a standardised letter to include key clinical information and any details of discussions with the patient which is then be sent by post to patients and electronically to their GP on the same day.

At the hub there is public health information provision relating to smoking cessation, diet and exercise, as well as local Eye Care Liaison Officer Services and low vision aid resource through sign posting to related services.

5.0 Equality

For patients who do not meet the inclusion criteria, such as those who are non-ambulatory or those who have cognitive impairment or special educational needs, they will continue to be offered face to face assessments at their local Moorfields network site in accordance with their clinical risk and wait time.

Any interpreting service requirements will be provided at the hub in the same way as for other Moorfields' sites. The requirement for interpreting services will be flagged on PAS and booked for the patient's appointment by the clerical staff member.

6.0 Clinical governance, risk management and quality improvement

- The Hoxton site sits under the overarching governance of Moorfields North Division and, as such, from an operational standpoint will be monitored and reviewed by the north division management structure. This will include:
    - KPI monitoring
    - Access performance
    - Outpatient performance
    - Incident reporting/investigation
    - Risk register management
- The Band 5 team leader has day to day operational responsibility for the safe running of the site, with oversight from dedicated senior clinical and managerial teams.
- All clinical decision-making in relation to patient management and monitoring of clinical risk/ individual patient disease status sits within the sub-speciality clinical governance structure.
- Ultimate accountability for the standard of patient care in relation to clinical decision-making will remain the responsibility of the named consultant.
- All technical staff have Basic Life Support training and if a patient becomes acutely unwell at the diagnostic hub there will be timely escalation to NHS 999 as appropriate.
- For patients with urgent ophthalmic needs, they will be asked to attend City Road A+E on the same day for urgent care.

7.0 Results so far

The new hub launched on 1st February 2021. We will publish clinical audit, value for money of the end-to-end patient pathway and benefits realisation studies in due course. In the meantime we can share the modelling and pilot data that we have already collated.

Sub-specialty	Metric	Traditional model of care	Diagnostic hub pilot assessment
Glaucoma	Median Journey Time (mins)	Follow-up: 94	Follow-up: 35
	Median Journey Time (mins)	New: 127	New: TBC (modelled as 47 mins)
Medical Retina	Median Journey Time (mins)	Follow-up: 110	Follow up 31
	Median Journey Time (mins)	New: 110	New: TBC

Glaucoma:

- 95% of the patients stratified are suitable low and medium risk patients for the diagnostic hub pathways.

Medical Retina

- 62% of the patients stratified are suitable low and medium risk patients for the diagnostic hub pathways.
  MR1 20%
  MR2 42%

Initial audit of a pilot clinic in MR, 6 week period – 1006 patient attendances

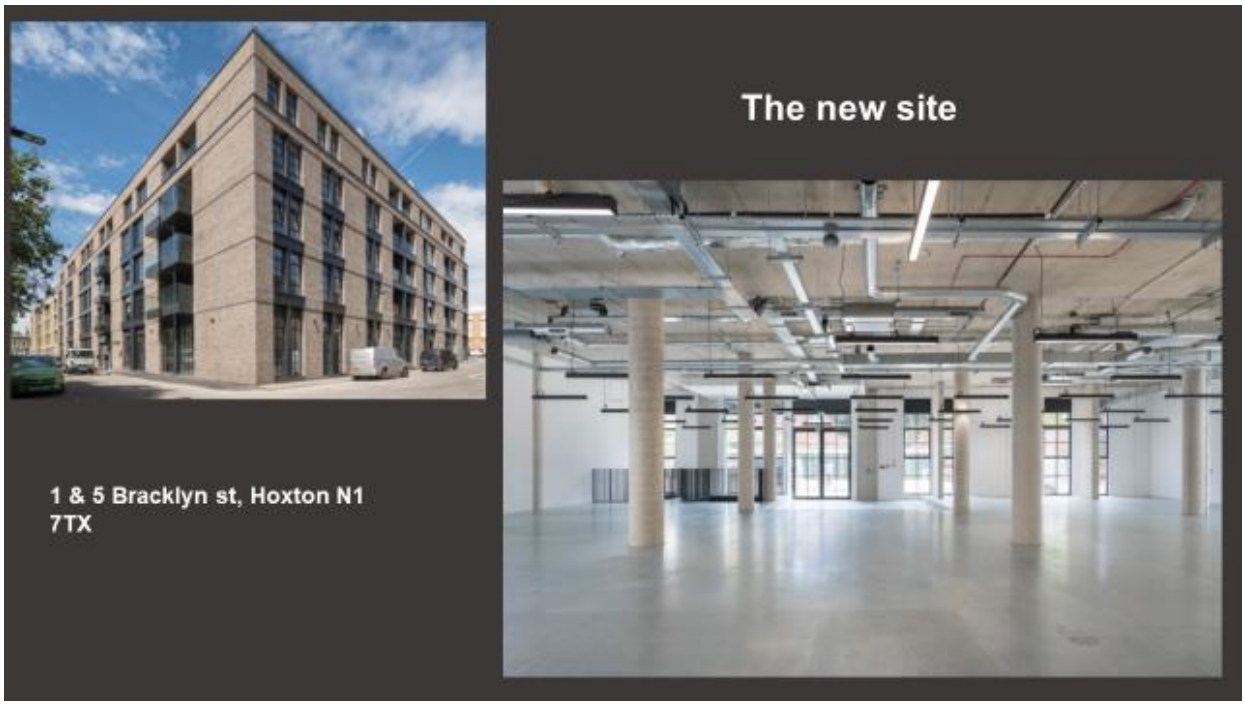
- Clinic Outcomes
  22.3% F2F Clinic
  63.9% Virtual Clinic
  5.3% Laser/injection clinic
  8.6% Discharged

- Urgent Outcomes
  6.2% Urgent clinic review <2 weeks (11.7% <1 month)
  No cases required emergency same day treatment.

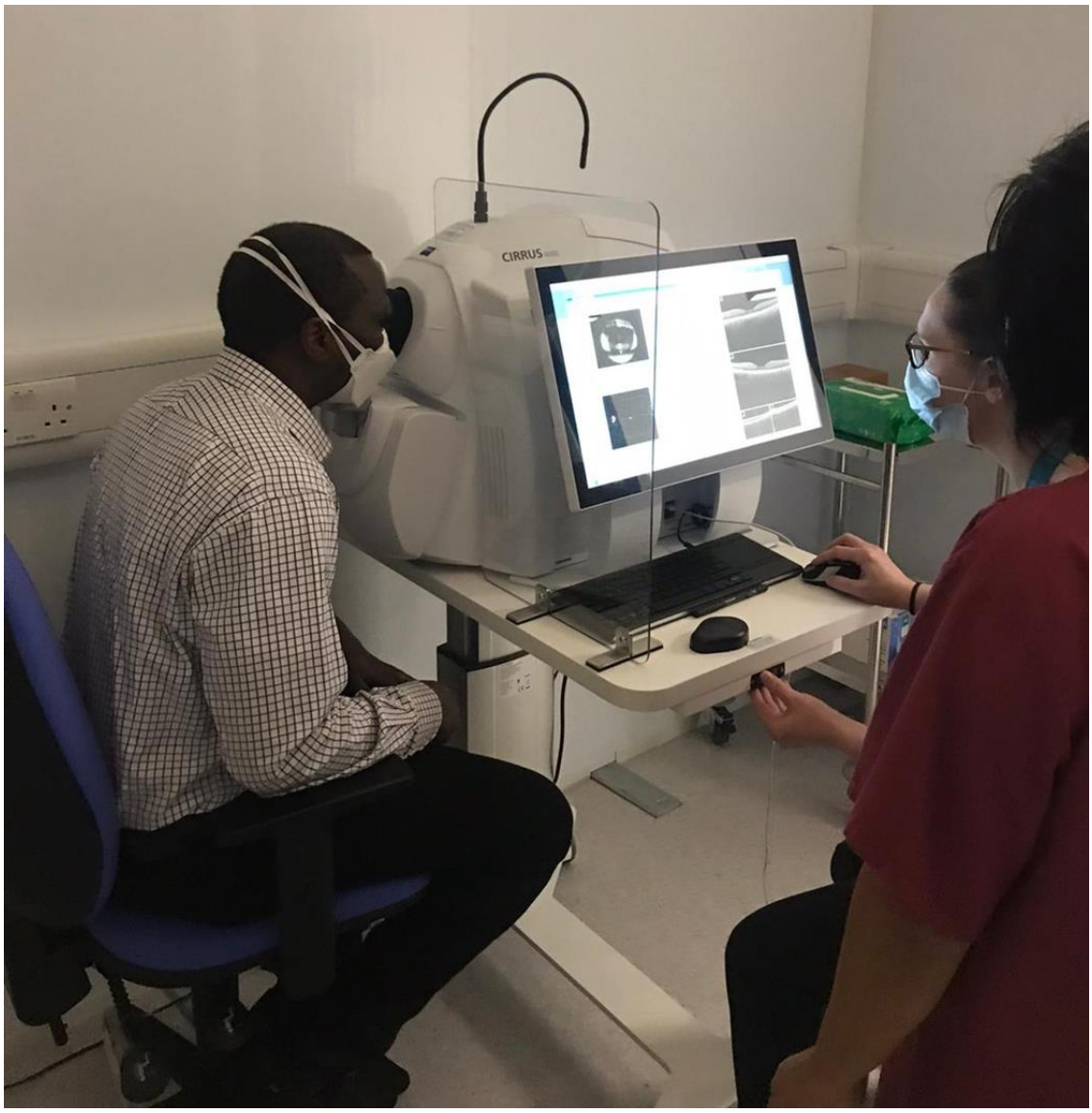
8.0 Limitations of the case study and ongoing work

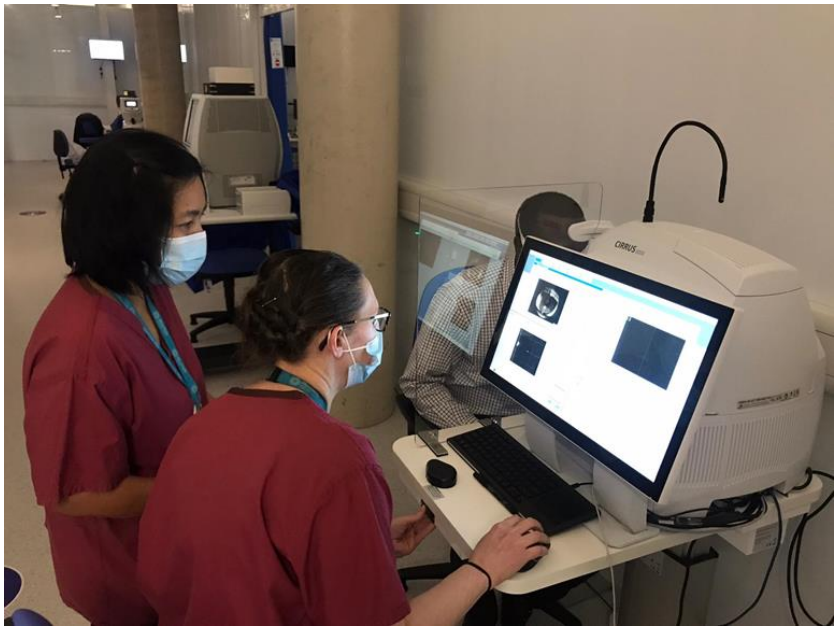
Moorfields has made a significant investment as we believe, based on our work over recent years, that this model is likely to deliver important benefits. Whilst we have highlighted that this model is able to significantly reduce the average journey times of patients on the day of attendance, we are mindful that this evaluation does not yet include the time for consultation/further management. The Moorfields hub at Hoxton is our new proof of concept and we are continuing the process of evaluation, learning and quality improvement as we deliver these services.

We plan to undertake detailed work on return on investment and benefits realisation, which we hope to publish in due course as the hub becomes fully operational. The diagnostic hub provides the perfect ongoing opportunity, through large data collection, for clinical audit, outcome and cost review.



21st January 2021


CIRRUS



Lead author: Kerry Tinkler (SRO) Clinical Director, Clinical Support Services

For further information contact: moorfields.serviceimprovement@nhs.net

Abbreviations:

AMD age related macular degeneration

BRVO branch retinal vein occlusion

CNVM choroidal neovascular membrane

CSCR central serous chorioretinopathy

DMO diabetic macular oedema

DNA did not attend

FU follow-up

GL glaucoma

HCQ hydroxychloroquine

HFA Humphrey (visual) field analyser

LPI laser peripheral iridotomy

MO macular oedema

MR medical retina

NPDR non proliferative diabetic retinopathy

OAG open angle glaucoma OHT ocular hypertension

OCT ocular coherence tomography, (scan usually of the eye, most commonly retina or optic nerve)

PAC(G) primary angle closure (glaucoma)

PDR proliferative diabetic retinopathy

R1, R2, M0 etc = diabetic retinopathy grading

SLT selective laser trabeculoplasty

VA visual acuity

VH vitreous haemorrhage

Hoxton Project team	
Kerry Tinkler	(SRO) Clinical Director, Clinical Support Services
Fraser Guillen	(PMO) Akeso
Emily Smith	Operations lead – Operations Manager
Clare Conaghan	Workforce lead - Interim Deputy Director HR
Tulga Reis	IT lead – IT Project Manager
Lesley Henry	Estates lead – Capital Projects Manager
Sarah Davies	Finance lead - Head of Finance (projects)
Julie Nott	Quality lead - Head of Risk and Safety
Lucy Benson	Communications Lead – External Communications Office
Melina Pataka	Equipment lead - Head of EBME
Education and training team	
Peter Holm	Head of Ophthalmic imaging & Ultrasound
Shilpa Kotecha	Training Developer
Richard Price Whittle	VLE/LMS Manager
Adam Mapani	Nurse Consultant (MR)
Tina Nemeth	Matron
Tendi Gwenhure	Clinical Tutor
Gordon Hay	Service Director Urgent care & Deputy Director for Education
Clinical Advisors	
Dilani Siriwardena	Consultant Ophthalmologist, CR Divisional Director & Deputy Medical Director
Luke Nicholson	Consultant Ophthalmologist
Robin Hamilton	Service Director MR
Gus Gazzard	Service Director Glaucoma
Adnan Tufail	Consultant Ophthalmologist
Hari Jayram	Consultant Ophthalmologist
Will Tucker	Divisional Director South
Branka Marjanovic	Joint Divisional Director North
Jonathan Clarke	Joint Divisional Director North
Operations Advisors	
Jeet Virdee	Divisional Manager - City Road
Farhana Sultana-Miah	Divisional Manager - North
Zoe Marjoram	Divisional Manager - South
Mary Maish	Head of Nursing - North
Kate Falkner	Head of nursing – City Road
Tom Alexander	Deputy General Manager - North
Tom Griggs	Operations Manager - MR
Joy Adesanya	Operations Manager - Glaucoma
Corporate Support	
Connor Beddow	Service Improvement Manager
Ella Preston	Service Improvement P&I lead
Alex Stamp	Deputy Chief Operating Officer
Laura Brewster	Director of Service Improvement
Paul Cartwright	Deputy Director Estates and Facilities
Catherine Wagland	Infection Control Matron (deputy DIPC)
Vikash Chudasama	Technical Lead IT infrastructure