Efficient, high-flow diagnostic and treatment services for eye care

Purpose of document

- The purpose of this document is to describe recent developments in high flow diagnostic and treatment eye care services. These services should provide an accessible setting for elective eye care diagnostic and treatment services, ideally outside of the acute hospital setting, supporting equity in access to the range of populations they will serve.
- Systems should incorporate high flow services, and consider delivery in hubs, as part of their plans for restoring and maintaining safe eye care in the face of rising demand.
- The document will concentrate on delivery of outpatient care. It will look at how these services fit within system-wide integrated care pathways and relate to clinical spaces: existing acute hospitals and optical practices, the proposed NHS community diagnostic hubs, and ophthalmology-specific hubs run in the community by the hospital eye service.
- Getting It Right First Time (GIRFT) and the Royal College of Ophthalmologists (RCOphth) will shortly publish specific resources for ophthalmic surgical hubs.

Background

- Ophthalmology is the highest volume outpatient specialty in the NHS providing approximately 8 million appointments a year. Many patients have chronic long-term conditions (LTCs) that require regular, timely and lifelong eye care to prevent permanent visual loss and many are also from groups more vulnerable to COVID-19, for example due to age and systemic co-morbidities.
- Demand for the high volume eye care areas (glaucoma, cataract, retina and urgent care) is predicted to rise by 40% over the next 20 years (RCOphth). There there have been multiple reported cases of patient harm with permanent loss of sight due to delayed outpatient follow-up, as capacity fails to keep pace with increasing demand in eye care services (Health Safety Investigation Branch (HSIB) , Getting it Right First Time (GIRFT), British Ophthalmic Surveillance Unit (BOSU).
- The COVID-19 pandemic has significantly worsened the capacity-demand mismatch in hospital with increased backlogs of patients and progression of patients' conditions, some of which is irreversible. COVID-19 has also increased pressure on primary care optometry services. The CUES pathway was introduced during lockdown to allow more urgent eye care to be delivered in optical practices working in close partnership with the hospital eye service (HES) and continues to provide a safe integrated service.
- The Eye Care Restoration and Transformation programme, part of the National Outpatient Transformation Programme, is working with national

stakeholders and patient organisations to drive the widespread adoption of digitally-supported care, coordinated whole-system eye care services and personalised healthcare for all patients. The Eye Care programme has shared with systems its Eye Care Roadmap which calls for systems to act **now** on five opportunities to scale up solutions to safely restore eye care services to minimise and prevent irreversible sight loss for patients:

  - **Implement integrated care pathways across primary, secondary and community eye care***
  - **Implement risk stratification and failsafe processes to reduce harm**
  - **Implement remote consultations for all appointments where appropriate, possible and safe**
  - **Implement virtual data assessments for all appointments where appropriate, possible and safe**
  - **Implement patient-initiated follow-up (PIFU) care.**

- The integrated eye care pathways identify opportunities throughout to deliver care beyond the traditional consultant-led in-hospital face to face consultation model. Through the use of remote consultations, diagnostics-only consultations, and better utilisation of the wider in-hospital and primary care optical workforce, systems can safely restore eyecare services. Space for ophthalmology is a significant limiting constraint in hospitals and more efficient use of in-hospital space or care delivered in other spaces, such as primary care optical practices and community diagnostic and treatment hubs, offer solutions for this.
- Sir Mike Richards has recently released his report into diagnostic services which recognises the need for radical reform and new service models for diagnostics to cope with the increased demand before the COVID-19 pandemic, and the additional needs for COVID-19 recovery. The report recommends the delivery of the bulk of NHS elective diagnostics through a small number of large Community Diagnostic Hubs (CDHs, three hubs per million population are envisaged) established away from acute hospital sites and made as COVID-19 secure as possible. The report outlines the potential benefits in terms of efficiency and improved outcomes for patients. Although the priority for CDHs is non-ophthalmic diagnostics, such as radiology imaging, endoscopy, pathology, genomics and physiological measurement services, there is specific mention of the potential for inclusion of ophthalmic diagnostics.
- HES providers are already starting to develop in-house or community-based diagnostic and treatment hubs or consider seeking incorporation of ophthalmology in the CDHs, looking to offer high-flow, efficient and standardised assessments and care including:

- Diagnostics-only assessments (data collection clinics)
- Non-medical clinician led clinics with medical oversight from acute hospitals
- Procedures such as intravitreal injections, laser treatment (YAG capsulotomy, laser for glaucoma, diabetic retinal laser), minor operations and cataract surgery.
- Potential for multi-specialty patient assessment and care e.g. comprehensive diabetic review, combined paediatric services or hydroxychoroquine treatment and monitoring.

How to balance options for high flow services within integrated eye care pathways

Decisions on the provision of high flow services, and the need for significant investment in new community space and equipment, should be based on a comprehensive analysis across all sectors of the existing and potential local capacity against population need. It is important to examine all options for system reform and how these options, or a combination of them, may impact on each other, on quality and safety of care, and costs. Care needs to be taken to ensure avoidance of directing investment into assessment of unrefined referrals or diverting resource inappropriately into assessment of low-risk patients at the expense of those at higher risk. A phased approach has been used to develop the small number of existing ophthalmology-specific high flow community hubs, starting with establishing the concept and processes in existing facilities. Whatever is decided, a whole system approach needs to be adopted to provide as broad and accessible a range of services as possible, with best utilisation of resources including space, equipment and workforce, avoidance of duplication and improved patient experience.

Factors to take into account include:

- Population need – current and projected future need
- Geography: rural, urban, travel and access challenges
- Workforce capacity (numbers and skills) and potential in both primary and secondary care
- Space, facilities and equipment, and connectivity capacity and potential in primary, community and secondary care
- Cost/benefit of each option or a combination of the options
- The need to provide safe, COVID-minimal facilities and to maximise throughput and efficient use of resources.
- Convenience and accessibility for patients.
- Services and conditions for which demand is outstripping capacity.
- Symptomatic presentations or identified conditions that may need multiple diagnostics, which can safely be undertaken off the acute site.

- Conditions amenable to diagnostics-only consultations and care and decision making delivered more independently by the wider workforce fully connected to the hospital and medical team.
- Scale of services needed to provide safe and efficient diagnosis and ongoing monitoring in line with current and future demand
- Availability of existing resource and sites for eye care in primary, community and hospital settings.
- Need for capital investment and ongoing estates, equipment, workforce development and other costs vs efficiencies for all options.

It is anticipated that a 3 tiered model is likely to be needed for eye care, based on risk profile, in line with the Richards report, all working to top decile efficiency:

1. High street optometrists for case finding, referral avoidance and some ongoing low risk care - face to face and supported by remote / virtual decisions from higher qualified optometrists and the hospital ophthalmic team
2. Reporting on diagnostic data collected from high flow, rapid throughput: settings in primary care optometry and community diagnostic hubs, and from home monitoring as technology develops, for ongoing monitoring of patients with established conditions
3. Hospital clinics largely reserved for those who need treatment or very high risk/complex cases.

Every setting has potential challenges and benefits for establishing efficient eye care services:

Setting	Challenges	Benefits
Hospital eye service	• Likely to continue having severe capacity limitations • Most hospital eye units have already maximised all existing space use to cope with long standing capacity issues • Hospital space is at a premium – more space unlikely • Limited re-configuration possibilities for high flow or social distancing • Space may be required for COVID-19 care during spikes • Staff may be required for COVID-19 care during spikes • Limited separation possible from COVID-19 acute care • Perceptions by patients of higher risk for COVID-19 transmission • May require investment in IT, equipment and estates for ideal efficiency • Fails to make full use of existing primary care optometrist workforce, equipment and estate	• No issues of integration with existing hospital service • No issues in standardisation / approved equipment • Equipment utilised used full time for ophthalmology care • Appropriate range of ophthalmic equipment available for “one stop” comprehensive assessment and decision making with avoidance of multiple visits • Staffed by HES staff with certainty of competence standards and ability to easily audit performance • Full digital connectivity with all NHS IT systems for EPR, imaging systems, and patient administration data • Hospital level quality assurance for imaging and test results • Infection control processes overseen by hospital ICP team • Covered by existing contracting and funding process

		• Non-commercial setting. • Access to patient support, information provision, assessments (e.g. drop compliance and drop technique training), counselling and low vision support including Eye Clinic Liaison Officers (ECLO) should be routinely available • Options of diagnostic assessments and remote consultations increases potential use limited space by highly trained specialists.
Optical practices	• May require work to ensure standardisation of equipment or investment • Lack of full digital connectivity to HES/NHS systems for EPR, imaging, communication, exchange of clinical information and collection of patient administration data • Quality assurance (eg imaging) and competency framework differs from standard HES process • Funding and commissioning mechanisms variable • Potential for patient to have to pay for extra imaging if not in a commissioned pathway • Patient perception about care in a "commercial" setting • Infection control precautions not overseen by hospital ICP team • Optical business concerns about commercial sustainability – does this make business sense? • Open business hours only (but many offer longer hours and most weekend working) • Limitations for adaptation of space for high flow patient environment • Equipment not utilised full time for ophthalmology care • Access to patient support, information provision, assessments (e.g. drop compliance and drop technique training), counselling, low vision support needs to be specifically arranged.	• Large amount of space / estate • Multiple (thousands) sites with choice and convenience for patients • Large existing well-trained primary care optical workforce • Significant amounts of existing diagnostic equipment • Convenient accessible locations/closer to home with booking at patient convenience • Staff will not be redeployed to COVID care • Space will not be redeployed to COVID care • Staff and site fully separated from COVID acute settings – patients may feel more confident attending • Particularly well placed to refine referrals at or shortly after first contact in primary care to reduce number of appointments/visits patients need to make • Uses existing workforce (who require no additional training for many diagnostics/referral refinement) and builds capacity by providing greater opportunities for advanced practice • Many patients prefer attending primary care setting and optical practice over a hospital environment. • Builds primary – secondary care relationships and confidence • Primary care clinicians gain greater clinical exposure and experience bringing wider benefits to the system • Continuity of care for the patient, with the patient able to be seen by their usual primary care professional
Ophthalmology diagnostic and treatment hubs in community run by HES	• Significant investment required in estates, equipment, IT, including hardware and servers • Required significant clinician and managerial planning and development time	• Site fully separated from acute sites and COVID care • Smaller number of more highly controlled and integrated (with HES) community settings

	• Can be some challenges of integration and connectivity even if using same NHS IT systems • Fails to take advantage of primary care optometrist workforce • Fails to take advantage of existing estate and equipment in primary care optometry • May disincentivise primary care investment in optical practice, potentially leading to increased referral activity • Fails to address duplication of care with primary care (eg repeat imaging already done in optical practice) • Requires new type of workforce with significant increase in technical and support workers • Relies on existing overstretched HES workforce to support - deliver training and clinical oversight If based within acute trust site, will not deliver care in community/closer to home • Reduced personal interaction with decision-making clinician – may lead to worse patient experience and more appointments • May mean more appointments as patient referred from primary care to hub (rather than diagnostics taking place within same primary care setting/appointment) • Once commissioned, revenue funding must be available to support long term delivery • Patient access and convenience may not be improved if a single community site is identified.	• Faster implementation and smaller sites/potential for more sites than CDH. • Standardised / approved equipment used full time for ophthalmology care • Economy of scale regarding equipment and salaried staff • Full range of ophthalmic equipment with facility for "one stop" comprehensive assessment and avoidance multiple visits • Staffed mainly by HES trained staff with certainty of equivalency of competence and ability to easily audit performance • Full digital connectivity, linked into all NHS IT, EPR and imaging systems for communication, exchange of clinical information and collection of patient administration data • Quality assurance, and competencies for undertaking imaging the same as HES • Infection control processes tightly overseen by hospital IC team • Covered by HES contracting and funding process • Perception as non-commercial setting • Can be open very long days and weekends. • Ability to treat large numbers of patients quickly and efficiently • Specifically designed to provide high flow diagnosis and care whilst supporting requirements for infection control for COVID-19 • Can take advantage of ophthalmology specific requirements for COVID-19 testing which may lessen burden of testing • Access to patient support, information provision, assessments (e.g. drop compliance and drop technique training), counselling and low vision support can be provided by staff from the MDT HES team including Eye Clinic Liaison Officers (ECLO) • Multiple potential sites e.g. shops, vans, storage containers etc • May be part of a bi or small multi-specialty hub to reduce visits required for patients with several conditions eg diabetes, paediatrics
Ophthalmology as part of multispecialty Community Diagnostic Hub	• ***As per ophthalmic specific hub plus***: • Space for ophthalmology may be very limited • Space may not be configured ideally for ophthalmology high flow	• ***Mostly as per ophthalmic specific hub*** • Likely to be pursued and resourced as part of wider NHSE plan for CDHs

	• Ophthalmology likely to be low priority for resource and investment • Ophthalmology advantages not fully realised as hub not primarily configured to service ophthalmology but rather non ophthalmic disease • Development of very large hubs may take considerable time to achieve whilst ophthalmology requirements are urgent • IT systems and equipment not primarily focused on ophthalmology specific requirements • No ability for multiple sites and redeployment of smaller spaces • Constrained by general non-ophthalmic requirements for COVID-19 testing which may be inappropriate for high volume ophthalmology outpatient care • Reduced personal interaction with decision-making clinician – may lead to worse patient experience and more appointments • May mean more appointments as patient referred from primary care to hub (rather than diagnostics taking place within same primary care setting/appointment) • Access issues given the number of sites proposed – the population in need of ophthalmology services attend regularly and are mainly elderly	• Could take advantage of synergies and access to wider range of non ophthalmic care and diagnostics

What should high flow diagnostic and treatment services be like?

- High flow eye care services should provide an accessible setting for efficient elective eye care diagnostic and treatment services, ideally outside of the acute hospital setting, supporting equity in access to the range of populations they will serve.
- Based on increasing demand and previous evidence from diagnostic-only and non-medical clinics, high flow services would be suitable for these areas:

    - AMD: Age-related macular degeneration - active treatment wet AMD, stable treated AMD
    - Glaucoma: Glaucoma and glaucoma-related conditions
    - Diabetic retinopathy: diabetic retinopathy, diabetic macular oedema; support for diabetic eye screening programme (DESP) OCT surveillance, slit lamp screening if not suitable for standard DESP programme
    - Retinal vein occlusions

- Paediatric and orthoptic services.

- **Addition subspecialty services** may include
  - Keratoconus
  - Triage of some new patients
  - Postoperative e.g. vitreoretinal, adnexal, strabismus
  - Long-term monitoring post-operative corneal graft patients
  - Minor oculoplastic procedures
  - Others as identified locally.

If a patient requires a consultation or discussion after the virtual data assessment, this can be delivered by remote telephone, video consultation or face-to-face, as required (see Eye Care Restoration Road Map). As technology advances, consideration can also be given as to whether services can incorporate home testing results.

- **Services should be delivered through**:
  - Diagnostics-only data assessments (see Virtual Data Assessment Toolkit for details on the significant benefits and potential of this modality in eye care)
  - Non-medical clinician face-to-face assessments at the end of the diagnostic bundle for some patients.

- **Other services which can be included** are:
  - Consultants and senior clinical decision-makers on site (sometimes or at all times) to review virtual data e.g. at a "reading station / centre" and provide rapid access to urgent opinions or interventions
  - High-flow, low risk procedures such as cataract surgery, laser procedures, minor oculoplastic procedures and intravitreal injections.

- **Out of scope**
  - First contact care, enhanced case finding, referral filtering and low complexity long term care is best suited to primary care optometry and should where possible be delivered in local optical practices (CCEHC primary eye care framework)
  - Urgent and emergency case should be delivered through a combination of the acute hospital setting and primary care optical practices through CUES and MECS.
  - Very high risk, complex care, care which is not able to be standardised and which needs significant consultant input, complex diagnostic tests and higher risk interventions should continue to be provided on acute hospital sites, for example vitreoretinal surgery, complex glaucoma, serious ocular inflammatory disease. In addition, any patients requiring diagnostics under general anaesthetic should be seen at an acute site.

- **Outcome**

  High flow eye care services should:

- increase and optimise capacity in the short- and longer-term through the separation of acute and complex from elective lower-risk ophthalmology provision and increase in clinical space available – providing benefits in terms of efficiency, quicker access to care and convenience for patients.
- improve patient experience of the eye care process and facilitate earlier diagnosis and timely treatment of a range of conditions, where possible providing all tests in one visit in a single location.
- minimise risks of transmission of COVID-19 between patients, visitors and staff, thereby providing a safe environment for patients and staff for the conduct of care for suitable ophthalmic conditions during the period in which COVID-19 is endemic.
- reduce patient journeys and improve sustainability, contributing to the NHS ambition to become Net Zero
- ensure high specification equipment is used efficiently and effectively with full time utilisation and high throughput.
- Optimise staff skills and relationships as they work across all eye care sites in the system.

Service delivery model

- **High flow eye care services should have the following key features**
  - a rapid throughput facility with a short patient journey for each visit
  - protocol-driven standardised care and co-ordinated testing
  - patients who require a predefined set of tests and assessments
  - appropriate diagnostics to ensure all investigations required are performed in one visit
  - internal design and space configuration to support high flow unidirectional patient flow for ophthalmic data collection and assessments
  - primarily by technical and non-medical clinician staffing
  - clear pathways for ophthalmic medical oversight, intervention and access for patients to clinical decision-makers and the consultant in charge of their care as they require it
  - minimised safe periods of face to face contact time between patients and staff with minimal handovers
  - compliance with COVID-19 infection prevention and control including social distancing
  - low COVID-19 premises (separate from acute hospital site or if on acute site properly segregated from COVID-19 higher risk areas e.g. COVID-19 or medical wards, A&E; measures to avoid attendance of those with or at risk of COVID-19)
  - able to function without consultant presence, with clear escalation protocols for urgent or emergency issues

- digitally connected, allowing networked access to hospital IT systems and full interoperability for required software (including patient administration, referral management, EPR and imaging devices and viewing) to enable remote review of test results by an appropriately skilled clinician, and suitable server capacity and back up.
- digitally connected to primary eye care for referrals, advice and guidance, feedback and integrated pathways.

- **Referral**
  - Referrals can be for new patients from primary care for triage or assessment and care, and also from secondary care for high flow one off or ongoing reviews. It is anticipated that the greater proportion of high flow care will be for follow-up patients and ongoing care of medium-high risk patients, with optical practices appropriately integrated to provide referral refinement and management of lower risk cases in primary care.
  - Referral criteria should be agreed across the system, based on risk, complexity and suitability of the patient and appropriate access to expert advice and guidance (see Roadmap Risk Toolkit). Appropriate assessment/triage will be required to determine which patients are suitable. Consideration should be given not only to suitable ophthalmic conditions and their level of risk and complexity, but also patient specific factors including vulnerabilities and requirement for extra support or time.
  - Prioritisation should be based on clinical need and risk, ensuring that patients receive the right test(s), first time and where possible on the same day (i.e. within the same appointment). Expert advice and guidance along with clinical decision aids should be available to primary care optometrists and GPs as well as the multidisciplinary hospital ophthalmic team, to ensure the most appropriate investigations are requested. This will result in faster diagnosis or identification of disease progression, greater efficiency, a better patient experience and reduced risk of COVID-19 infection through fewer visits and travel.
  - Bookings should be by appointment, where possible allowing patients to choose times. Patients should be able to answer pre-appointment questions related to the specific tests and their general and ophthalmic health prior to their appointment and should receive appropriate preparatory information relating to their appointment.
  - Clear protocols should be established for communicating results of assessment to patients and to the referring clinician and/or clinician in charge of care, including primary care optometrists. In some cases, it will be necessary to have an appropriate clinician (medical or non-medical) within the high flow service to communicate information immediately. In other cases, reporting on investigations will be done remotely. In all cases, requesting clinicians should have access to advice on the interpretation of results.

Diagnostic images and results of other investigations and patient records should be available for review by multidisciplinary teams.

- Development of integrated symptom- and condition-based pathways, diagnostic bundles and protocols for diagnosis and monitoring, as agreed between primary and secondary care, will be vital. These should incorporate lessons learned from changes made at the peak of the pandemic and should encompass referral criteria, advice and guidance, clinical decision making and communication of diagnostic findings. This must be underpinned by IT connectivity.

Location

- The high flow services will ideally be sited away from acute hospitals, with adequate public transport links and car parking, as well as accessibility for patient transport services and patient drop off. NHS community hospitals, GP primary care networks, optical practices, retail parks or high street shopping centres may provide suitable locations with decisions being made based on local need. Mobile and flexible space may also be appropriate in some localities (e.g. Vanguard units, freight containers, prefabricated modular builds).
- Selection of sites should be undertaken with reference to other estates transformation plans in the health and care sector locally. This should focus on patient access and convenience and should explore opportunities to co-locate with primary care teams and to optimise the use of space owned by community trusts, optical practices and local authorities as well as CDHs.
- Selection of sites should be undertaken with consideration of the speed of mobilisation as the need for eye care restoration is pressing due to known cases of harm from unsafe delays.
- Selection of sites should improve equity of access and support inclusion by considering physical, cultural and social needs of different/diverse population health groups, supporting the NHS Long Term Plan commitment to narrowing health inequalities.
- Sites need to be able to be suitably configured internally to specifically support COVID-safe, high flow ophthalmology assessments and ideally offer flexibility to adapt from learning and advances in diagnostics or clinical guidance
- Sites will need to offer suitable power supply and other requirements to safely house the diagnostic and treatment equipment to be housed. The need for clinical waste removal will also need to be incorporated into requirements.
- If co-located with an acute hospital, there should be a separate entrance such that neither staff nor patients attending are required to enter the main hospital building. Eye hospitals and standalone units may be able to provide that separation from acute services whilst continuing care on a hospital site in a way that other specialties cannot.

- The use of existing and new estate should comply with modern environmental standards and ensure maximal energy efficiency to help reduce emissions and embed the ambition for the NHS to become Net Zero.

Operational information

- **Hours of operation**
  Ideally, high flow eye care services should operate for 12-14 hours a day and 7 days per week. However, workforce constraints may make this unachievable in the short-term. Promoting more staff flexibility across primary/community/secondary care with clear options for professional development should aid this.

- **Inspection and accreditation**
  Services delivered within a HES led site will be subject to CQC registration and inspection and should meet accreditation standards as set out for each service.

Safety/IPC

- High flow services should be low risk COVID-19 sites. The high volume and potentially short journey time for ophthalmology patients mean that requirements for testing may not be the same as for other specialties and the advantages and disadvantages for virus testing for staff and patients in ophthalmology-only services need a local risk assessment, with the flexibility to take into account fluctuating local community infection rates. For ophthalmology services within a wider specialty CDH, processes will need to be in line with those for other specialties.
- Testing of staff and patients along with symptom checking allows for a 1m social distancing rule to be applied in the facility. It also removes the need for deep cleaning and high grade PPE for most diagnostic modalities unless aerosol generating (disinfectant wipe down only between patients required for most imaging equipment). It may also be reviewed and adapted depending on local risk assessments.
- Without testing a 2m rule applies and more rigorous infection prevention procedures and cleaning are required (see up to date RCOphth and PHE guidance for more details).
- The layout should respect social distancing whilst optimising efficiency and use of space with design specifically for ophthalmology assessments.
- Staff should move as infrequently as possible between sites treating patients with known COVID-19 and high flow services or it may be decided to separate high flow staff completely from those in acute or COVID-19 higher risk sites All staff should have a daily symptom check. Consider whether all staff are COVID-tested weekly if an ophthalmology-only site.

- Patients notified up to 72 hrs in advance of appointment of the rules to follow on arrival, and taken through a pre-screening questionnaire (symptoms, travel etc).
- Patients provided with face masks on arrival to wear unless medically exempt, consider the role of temperature checks.
- Consider whether patient testing is required. If required, patients can be tested on arrival in car (or in holding area if not travelling by car). Use c.10-40m time to undertake pre-procedure checking including temperature, symptom check, rapid COVID-19 testing if and where available, and any pre-procedure admin.
- If not testing, consider if any other pre-visit requirements such as any period of strict social distancing or self-isolation required.
- Symptom and test positive patients should not be seen in the high flow services. Provision needs to be made to either safely defer or provide an alternative pathway if care is urgent.
- All patients attend unaccompanied unless they meet criteria for needing assistance which cannot be provided by staff. All those accompanying patients also go through infection prevention steps as above and wear masks.
- Adequate PPE should be provided for staff, depending on the procedure to be undertaken.
- Rigorous cleaning regimens, following relevant current guidance, (including for equipment and IT equipment) should be in place, the level of which is affected by whether or not staff and patient testing is undertaken.
- Appropriate provision for resuscitation (equipment and trained staff) needs to be in place as well as pathways and protocols for the identification, management and transfer of patients who have deteriorated, collapsed or are suspected to have cerebrovascular events and similar.

Workforce

- The high flow service should be staffed in line with core workforce requirements and must have robust links to clinical specialists to ensure a diagnosis or decision can be made or issues addressed. The majority of the workforce will be technical / healthcare assistants and support workers and non-medical clinicians i.e. optometrists, orthoptists and nurses.
- The expectation is that the workforce shall have strong links with the acute hospital sites to ensure knowledge and expertise is consistent across care settings. Safety/IPC policies will need to be adhered to in order to maintain COVID-minimal status.
- Involvement of staff who can work across the boundaries of primary and secondary care, such as optometrists and orthoptists, can provide greater flexibility, encourages better integration of the whole system workforce and provide opportunities for professional development.
- HR processes including HR passports should support flexible use of the multidisciplinary ophthalmic and optical workforce across the system.

- Critical mass of staffing to undertake assessments and procedures should be considered when determining safety.
- Workforce implications should be considered in determining the layout of equipment to minimise staff numbers, support efficient utilisation of the workforce and equipment and minimise handovers, for example, parallel lanes of sequential imaging and assessment stations.
- Training for high flow set up, working and processes needs to be considered.
- High flow services should offer staff new roles, development opportunities, greater flexibility, improved teaching and training and a chance to work in innovative ways. Some larger hubs could also become training academies e.g. for medical trainees, advanced non-medical practitioners via the Ophthalmic Practitioner Training (OTP) and optometry higher qualifications, as well as local experience and training for both hospital and primary care optometrists and other non medical clinicians

Integrated care/IT interoperability and connectivity and devices

- High flow eye care services will need to be digitally integrated into the whole system eye care pathways and therefore the IT infrastructure will need to support the transfer of diagnostic results, clinical reports and images etc across organisational boundaries so these are available to all healthcare professionals including secondary and tertiary care and, where possible, primary care optometrists and GPs. This needs to be via the transfer and full display of all ophthalmic imaging modalities and needs to be able to handle the original file and not convert in any way to allow full analytical flexibility particularly for full volumetric OCTs or ultrawide field imaging. HES led hubs should be integrated with key NHS hospital IT systems (e.g. ophthalmic or all specialty EPR, ophthalmic imaging devices and viewing systems, patient administration systems, referral systems).
- Eye care has significant specialty-specific requirements for software and equipment related to imaging and diagnostics. Multiple devices from a range of manufacturers are available which, even with CE marking, do not have to adhere to any specific standards to be eligible for use within the ophthalmology service. It is likely that locally approved cameras and software would be required and the hub needs a robust two-way imaging & data system that can capture, store, point, retrieve and display original format data with the ability to handle a diverse range a file formats (not just DICOM) from all relevant ophthalmic sub speciality device types, including but not limited to OCT & fundus images. A local system wide minimum standard for hardware, particularly medical grade monitors for review and capture, should be considered.

Clinical governance, risk management and quality improvement

- High flow eye care services would be expected to meet the same performance and quality standards as for existing services including metrics for outcomes but with higher throughput of patients.
- Patient relevant factors including patient experience should form part of the key metrics and be used to drive improvement.
- There should be specific plans to ensure patient care is not compromised in terms of access to consultant and ophthalmologist communication and discussion, wider support, counselling (e.g. sight loss and Eye Clinic Liaison Officer functions) and health promotion.
- High flow services working with multiple organisations could create clinical risks, which need to be mitigated. For example, robust mechanisms should be in place to action the results from investigations, including a clear way for abnormal reports to be escalated or for an urgent discussion, assessment or intervention from an ophthalmologist or consultant. Failsafe mechanisms must be robust.
- High flow services should have a clear relationship to the rest of the system wide eye care provision and integrated pathways which includes clinical information sharing, clinical governance and leadership links.
- Patients care should be under a named ophthalmology consultant (or equivalent e.g. autonomous associate specialist or optometry or nurse consultant) at all times. Consider a liaison clinician contact for each patient for issues and discussions and to facilitate communication.
- The quality and safety of diagnostics delivered in high flow services should be rigorously monitored. This will include the number of patients being referred and investigated, quality assurance and accuracy of the investigations, adherence of protocols, timeliness of investigations and results reported to requesting clinicians and patients, false positives and negatives, near misses.
- There must be clear pathways for ophthalmic medical oversight, intervention and access for patients to clinical decision makers and the consultant in charge of their care as they require it. There must also be clear discharge protocols.
- As experience with high flow increases, it will be important to share learning both regionally and nationally.

Further details on steps for planning and implementation can be found in the appendix.

Appendix – Resources for systems and providers to support planning an ophthalmology diagnostic and treatment hub – key steps.

1. Identify local population need, geographical and access considerations and workforce/resource capacity

Undertake:

- A local needs assessment of current and future need for the population
- A detailed capacity and capability analysis of the existing system to include space, workforce, equipment, IT
- Assess and identify gaps
- Analyse local options to make best use of the existing system, taking into account the geography, travel and access issues of a limited number of sites (e.g. a large community hub) versus multiple sites (e.g. in existing primary care settings including optical practices)
- Analyse options including combinations of options to address the gaps and plan the integrated service which could best serve current and future need
- Always take a whole pathway, whole system approach with plans for the current and the future situation. Involve all stakeholders. See the Eye Care Roadmap for more details.

2. Identify suitable patients:

A decision needs to be taken on the criteria for patients to be seen in high flow services. Consideration needs to be given to:

- Ophthalmic factors:
    - which subspecialties, conditions or groups or conditions
    - risk and complexity stratification factors
    - urgency and ability to plan

and

- Patient factors such as:
    - mental capacity
    - vulnerability
    - requirements for extra support or time e.g language, mobility
    - anxiety and concerns about their condition

- Communication options for appointments, further follow-up and results of tests.

However, there may be a much wider set of patients who are potentially suitable. Some conditions or patients where high flow or diagnostic-only assessments might be perceived to be unsuitable may be addressed by:

- diagnostic assessment immediately followed by a face-to-face consultation at the end of the pathway
- diagnostic-only assessment followed by later video or phone consultation
- incorporating improved patient information provision and support (see below).

A written set of risk-based criteria for virtual data assessment and high flow suitability, with exclusion criteria, should to be incorporated into protocols and SOPs for admin, technical and clinical staff once agreed.

Careful equality assessment should be applied to reduce increasing risk of widening inequalities

2. Decide on diagnostic bundles

Standardised diagnostic and care pathways, with a clear set of investigations and steps in the pathway (diagnostic bundles), should be developed for each major care area, condition or group of patients. This should be a clinically agreed minimum standard to allow safe and effective assessment of patients which takes into account:

- what are the essential tests to reduce the overall journey time and therefore COVID-19 transmission risk to staff and patients
- the added clinical value provided by each test
- whether certain diagnostic bundles apply to only specific subgroups of patients vs all patients in the group (e.g. new glaucoma and follow up glaucoma tested differently vs all glaucoma patients tested using the same bundle)
- whether the same diagnostic bundles can be applied to more than one condition or patient group (e.g. using the same or a different testing strategy for AMD and other retinal conditions such as diabetic retinopathy)
- using tests for which results can be remotely reviewed by a clinician.

Example retinal condition diagnostic bundle: (See *Further materials* at the end of the document for more examples of possible diagnostic bundles):

Consideration needs to be given to how far to subdivide different conditions (e.g. glaucoma vs retinal) and condition subgroups (e.g. AMD new vs AMD follow up) and separate them in terms of testing bundles and different clinics. Efficiency is more likely the more standardisation is possible - but there needs to be cognisance of changing or 'non protocol' signs or symptoms. There can be small differences in what would be the minimum set of tests not only between different groups but even between individual patients, but there is also a significant amount of overlap between different groups and patients.

The right balance needs to be found between:

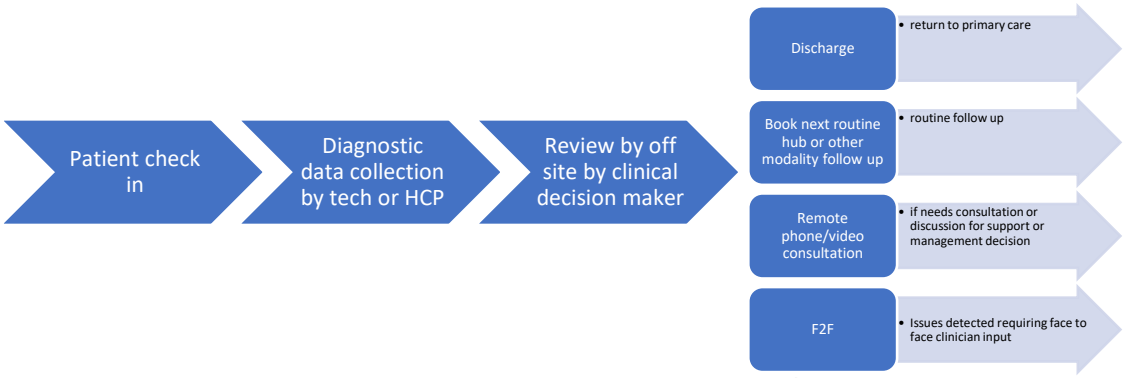
- subdividing into very small cohorts who perform the absolute minimum of tests but this may limit flexibility of booking and cause confusion or might create the need for a return visit for an extra test which has been missed or required because of a change in clinical situation

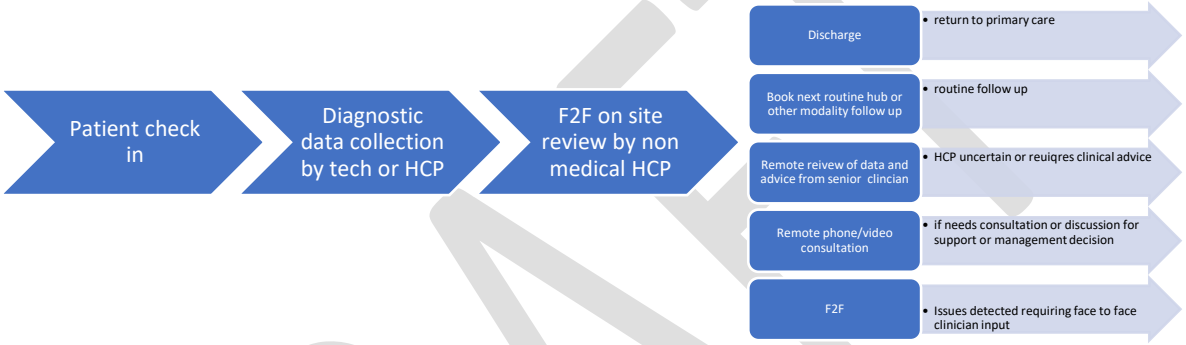
or

- over testing by merging groups, which increases flexibility and standardisation, reduces the likelihood of need to return for an extra test but may be wasteful or lengthen the journey time.

Getting started: for many hospitals and systems, it is extremely challenging to identify initially / retrospectively which patients are suitable for which pathways or bundles from existing data systems. For many, routinely held data does not allow easy identification of patients down to condition level without significant technical algorithms searching patient letters or triaging notes etc. One way to manage this is for all or large similar groups of follow-up patients to undergo a "standard" bundle, with an ability to then record on the IT system which bundle they need next time – so start to build up that data set for planning purposes.

Those needing consultations: A decision also needs to be taken as to which patients or groups might undergo the diagnostic bundle followed by a non-medical (or in some cases consultant led) face-to-face consultation appointment on site. Note that for such face-to-face assessments, consultants could offer virtual second opinions or advice for the practitioner either synchronously or asynchronously.





Before attendance: Consider how much of the data might be collected from patients prior to attendance e.g. patients can answer pre-appointment questions relating to their eye condition or specific tests (e.g. fluorescein angiography safety checks) and their general health and medication prior to their appointment. This could be done online or via telephone calls or simply paper forms to bring with them.

3: Layout, pathway and flow

In the ideal high flow service, form follows function – that is, the design and layout of the space and equipment will be determined by what you are trying to deliver and how you are trying to deliver it – but with future flexibility in mind. Internal design and space configuration needs to specifically support high volume unidirectional flow of ophthalmic data collection, whilst respecting social distancing. Units usually opt for a parallel structures, sometimes known as “lanes”, where the patient can move from one test to the next in a linear fashion with no requirement to be in waiting areas in between tests and minimum space between each test “station” allowing for manoeuvring and social distancing requirements.

Space and equipment ideally have internal flexibility, to allow modification as more is learnt on the best configuration for infection control, safety, experience and efficiency.

Some thinking may be required around issues such as whether there will be mixed clinics where different groups of patients will require different bundles delivered in each parallel flow or whether the whole session and all lanes will be dedicated to one group of patients “processed” in the same way. In addition, consideration needs to be given to how to incorporate:

- any face-to-face assessments required at the end
- how many parallel lanes
- achieving physical distancing
- manoeuvrability and accessibility especially for patients with mobility issues or in a wheelchair or learning difficulties requiring extra time
- different lanes for patients who flow at different speeds
- lanes in which training can occur
- provision for unexpected issues such as decant lane
- reception
- waiting areas
- areas for patient support and information provision (e.g. drop technique assessment and training, information and advice on prevention issues, information on condition etc). and whether any of this can be delivered in groups
- any requirements for consulting rooms
- private areas/rooms for sensitive discussions.

4. Demand vs capacity

Demand

Once there is agreement on the criteria for attendance at high flow services (conditions and risk/complexity), patients need to be identified as suitable. For those already in the system (i.e. awaiting follow-up including any backlog) and referrals already accepted, there will need to be a system, including providing enough dedicated time, for administrators and clinicians to review PAS and records to identify suitable patients and which diagnostic bundle or pathway they require. This data will ideally need to be recorded in the PAS and/or records system. This will allow patients to be planned to enter high flow clinics once ready and provide an estimate of the demand going forward. See above in **Getting Started** about the potential approach to have universal pathway for first high flow attendances for follow-up patients with more detailed forward planning undertaken from that visit.

As a rough guide, experience at trusts who have undertaken planning estimates the following % suitable patients broken down by subspecialty:

Glaucoma – >75% follow ups

AMD –30-50% of follow-ups (more if offer one stop or treat and extend injection service at the hub)

Diabetic –follow-up 45% (stable no laser or injections for 6 months), higher if offer injections and lasers on site.

Retinal vein occlusions: 30% stable no laser or injections for 6 months, higher if offer injections and lasers on site

Paediatrics – 50-60%

Keratoconus – 90%

VR: follow up from 10-40%

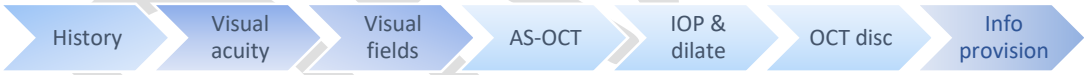
Once the high flow service is up and running, a similar system will need to be in place to ensure suitable patients who need follow-up can be identified and booked into the service.

Capacity

A modelling of likely capacity in the service can be undertaken based on the estimated patient journey time using evidence/experience from current practice and time and motion study data for any proposed diagnostic bundles. This can be multiplied by the number of parallel 'lanes' or pathways that can be run at any one time depending on space and layout, equipment, staffing and waiting room capacity.

Remember to take into account what devices and what software are used to capture data – this may affect acquisition times through using anatomical position systems, numbers of scans per eye, varying analyses of the data to create the output. Remember also to include any time requirements for extra infection control precautions e.g. cleaning equipment or donning and doffing PPE.

For example: New glaucoma bundle (illustrative times only)



Test/assessment	Time (mins)	Decontamination time (mins)	Total time (mins)
History	5	N/A	5
VA	5	0.5	5.5
VF	15	1.5	16.5
AS-OCT	6	1	7
IOP	2	0.5	2.5
Dilate	15	N/A	15
OCT disc	6	1	7
Info provision	10	/A	10
Total			68.5

Or

Test/assessment	Time (mins)	Decontamination time	Total time
VA	5	0.5	5.5
VF	15	1.5	16.5
AS-OCT	6	1	7
IOP	2	0.5	2.5
Dilate, Hx, info	15	N/A	15
OCT disc	6	1	7
Total			**53.5**

The time per patient can be used to calculate how many patients can be seen per lane per 4 hour session:

	Glaucoma follow up	AMD	Glaucoma new
Time per patient	30mins	45 mins	1hr
Patients per Session 'per lane'	8	5	4

Calculations can then be made either:

- in detail per major patient group if there is good understanding of the ophthalmology patient population broken down by conditon/subspeciality and understanding of relevant new and follow up ratios

or

- in a less complex way, to look at the overall ophthalmology cohort with average figures on likely subspecialty split (eg approximately 20% of ophthalmology is glaucoma, approximately 20% medical retina etc, with a % estimate of those suitable for hubs) to understand likely annual capacity.

The calculation might be: *Each lane can see approximately.X patients per half day session, or X patients per day. Three lanes run over two sessions per day provide X appointments per day and X per week. Over 42 weeks of the year at X appointments per week this amounts to X patients.*
This can be compared to the likely demand to see the effect on the backlog and the ongoing demand.

5. Equipment & IT

The type of equipment required is determined by the tests on the diagnostic bundles and the demand for each. Key equipment demands for high volume disorders are likely to be:

- log MAR VA charts – all pathways require this
- Autorefractor
- IOP: I-care, Reichart Ocular Response Analyser (ORA) or Goldmann: most pathways will require IOP checks but non glaucoma can use I care.
- OCT is required for glaucoma and retina conditions,
- Visual field machines for glaucoma - consistent
- Fundus and optic disc imaging required for retinal and glaucoma; consider if fundus autofluorescence is needed and consider the requirement for upgrades and flexibility of hardware and software for this imaging
- Wide field camera for retinal conditions excluding AMD – careful consider on the choice between widefield/SLO's and ultrawide field cameras where significantly more time is needed to review images
- Pentacam for keratoconus and corneal conditions.

Note that it may be possible to combine some imaging on the same device e.g. OCT and OCT-A or OCT and wide field camera

Other equipment can include:

- Slit lamps
- Anterior segment photography
- Tablets / laptops to record vision or IOP into EPR where there is no desktop
- Desktops or laptops for on site or remote image reviews/grading & video consultation

The exact details of selection of hardware and software, devices, interoperability, storage and back up, and related costs, can be a minefeld for ophthalmology and needs careful consideration about aspects such as:

- Standardiser or approved equipment – for example Diabetic Eye Screening for example use only approved hardware and software that must go through a structured approval process to ensure consistency and safety across the board. https://www.gov.uk/government/publications/diabetic-eye-screening-approved-cameras-and-settings. Using approved devices also helps significant with designing a training plan for staff.
- A minimum standard for hardware, particularly medical grade monitors for review and capture, needs to be considered. E.g. https://www.cybernetman.com/blog/brief-introduction-medical-grade-monitors/#:~:text=A%20Brief%20Introduction%20to%20Medical%20Grade%20Monitors%201,%E2%80%93%20Medical%20Touchscreen%20Monitor.%20...%206%20Final%20Words
- Ability to provide a robust 2 way imaging & data system that can capture, store, point, retrieve and display data with the ability to handle a diverse range a file formats from every kind of ophthalmic sub speciality device type. Data should be readable in its **original format** (not just DICOM) to reference the original file/data. This offers huge savings on storage, maintenance and enormously enhanced data quality and integrity.

- Ensure systems and images are networked, stored and backed up with appropriate IG security. Consideration will need to be given to PACS, EPR, dongles, licenses for software, servers etc. Some of the biggest "hidden costs" are for storage, additional licences (site wide or single premise licence models should be considered), dongles, archiving (although many databases and ophthalmic imaging file types cannot be archived using PACS) and the ongoing support cost for these.
- A gap analysis will need to be undertaken with what equipment is available across the whole system and what is required. It is important to note that establishment of a new community site is likely to require an initial investment of capital, and there will be requirements for ongoing maintenance and support costs, normally up to 20% of initial capital cost annually before any annual inflation rates.

6. Workforce & training

There are some important considerations when identifying staff numbers and skill mix for hospital-led high flow services:

- Many of the assessments to obtain diagnostic data can be undertaken by band 3 and 4 technicians and health care assistants/health care support workers, supported by non-medical staff.
- Some assessments or care may require a band 5 health care professional.
- If there are face-to-face assessments, the role of band 6-8 health care professionals also needs to be considered, depending on the level of autonomy and the risk and complexity of the patient cohort and care.
- Staff for administration, reception and support for both patients and staff also need to be factored in
- Primary care optometrists may provide high flow care in optical practices but may also be willing to work in hospital-run sites on a sessional basis for part of their week, increasing the workforce and supporting their upskilling to deliver more ophthalmology in their own practice. Any professional who can work across the boundaries of primary/secondary/community care as part of the expanded ophthalmology team should be considered as potential flexible staffing pool.
- The number of staff involved during the on-site patient journey should be minimised including reduction in handovers which creates a speedier pathway and reduction in COVID exposure
- Failsafe officers need to be incorporated into the hub process
- A very significant consideration is the workforce for reviewing and acting upon the diagnostic data during a virtual review of the data, which is usually done at a later stage ie the clinical decision makers. This needs to use a multidisciplinary approach with a range of trained and advanced practice non-medical clinical decision makers and ophthalmologists in training supported by

consultant ophthalmologists. Suitably qualified and experienced primary care optometrists can be part of the clinical decision making group.

- Planning and establishment of the workforce needs to include numbers of staff, skill mix and training of staff and any increase in this from the current resource. Training needs to cover both the face to face element (assessment and high flow practice) and the virtual decision making and subsequent communication or consultation process.
- Staff including consultant ophthalmologists need time in their job plan for the virtual review, reporting and any subsequent remote consultations. They also need time for support, advice and second opinions to the wider team of clinical decision maker and also to support training, development of processes and SOPs and continuing clinical governance.

For optometry-led care models with service delivery in primary care optometric practice, the considerations are broadly similar. Many assessments can be undertaken by practice support staff, with clinical oversight provided by the primary care optometrist and / or the acute hospital. Immediate patient consultations could be provided to those identified as likely to require a two-way conversation regarding the outcome. An optometric practice may adopt a high flow clinic model, where all people attending in a session receive a diagnostic bundle and virtual review, as anticipated in the hospital-led model. The workforce is already trained in optical practices and in place so are ready to 'turn on' services at pace. Practices may also become information centres for patients who have questions or require further information about their eye condition following a diagnostic episode.

Optical practices are well placed to tender a more flexible approach, offering appointments and adjusting the clinical offer based on individual patient need to achieve a one-stop approach and real-time decision-making, in many cases. This flexible approach means that optical practices could be responsive to fluctuations in demand, until restoration period has passed and the demand becomes more linear in nature. Practices could increase and decrease capacity for restoration services against the buffer of regular sight tests, as there are likely to be activity wave for some time.

A gap analysis in terms of numbers and skill mix of staff and training requirements should be undertaken and it is crucial to have clear training routes and competencies recorded and updated as part of performance management and annual appraisal.

Staff need to be working to a clear protocol and SOPs to ensure consistency and safety and SOPs should cover:

- Patient eligibility criteria (selection)

- Diagnostic bundles
- Clinic scheduling
- Pathway – clinical
- Pathway – admin
- Booking (diagnostic and clinical review episodes)
- Review/Grading
- Outcome – and support channels
- Communication with patients and other professionals of the results of the visit
- Red flags and urgent situations
- KPIs
- Failsafe
- Audit
- Staffing and skill mix
- Clear pathways for ophthalmic medical oversight, intervention and access for patients to clinical decision makers and the consultant in charge of their care as they require it.

7. Patient support assessment and information

Although we need to ensure patients are seen and assessed efficiently, thought needs to be given as to how to ensure efficiency does not become a conveyor belt or impersonal experience. In addition, it is important to ensure patients are not deprived of consultant input and access, and patients can still receive the support, communication, discussion and personalised care they require, taking their individual needs into account. Supplementary telephone and video consultations following any hub virtual diagnostic assessment clinic can address some of these.

Patients require appropriate information about this service model, advance warning and information, particularly if they have not received care in this manner before. They require routes to access advice and information from clinicians as required for queries, concerns or issues either on the visit and/or before and after. Patients also need to be given choice and the ability to input on how they are seen as much as possible as well as ideally be given choice over the timing of their attendance. Protocols need to be in place for communicating results of investigations and assessment to patients, with clarity and in appropriate language and format, compliant with accessibility standards, and to the requesting/other involved clinicians. In some cases, it will be important to have an appropriate clinician (medical or non-medical) within the hub to communicate information immediately. In other cases, reporting on investigations will be done remotely. Access to interpretation services must be available.

There needs to be clear understanding by the patient and other professionals of how the patient and their primary care clinicians (GP, optometrist) receive information on the outcome of their virtual data review, including any requirement for management changes. This should ideally be sent electronically to minimise overheads and maximise efficiency and timeliness. Also need to have clarity about how the patients can obtain advice or discussion if required or they are uncertain about the decision. A patient liaison or contact clinician can be very helpful for this.

There needs to be support in terms of patient information and frequently asked questions ideally with options for remote online or video information. For retinal and glaucoma conditions in particular, NICE has clear guidance about what information and support patients should receive both on first diagnosis and during ongoing care which needs to be adhered to.

Particular thought should be given to:

- Patient information: written, online and verbal face-to-face, group options
- Drop assessments: compliance and side effects or problems
- Drop techniques: assessment and training
- Health prevention support e.g. stop smoking, diabetic control
- Counselling
- ECLO and sight loss support
- Low vision aids or direction to access these.

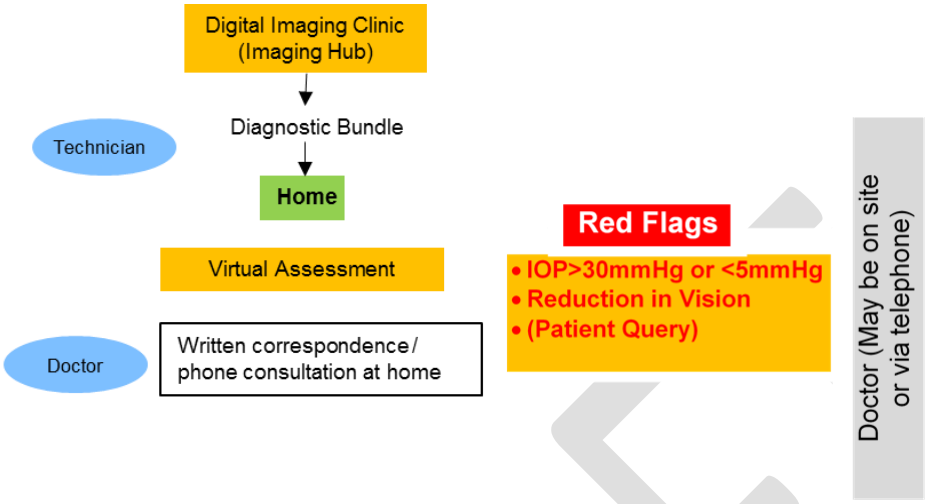
Consider the use of patient groups for joint information and question and answer sessions and mutual support.

It is also important for all innovations or models of care that thought is given to equality as per the protected characterises in the Equalities Act 2010 so as to not disadvantage specific groups such as: non-English speakers; mobility and wheel chair use; reduced mental capacity, hard to reach groups; other vulnerability; IT limitations and digital exclusion. The high flow model ideally should be able to incorporate the ability to offer its advantages to a wide group of patients but, where this is not possible, there must be ways to ensure patients can still receive care equitably. An equality impact assessment should be undertaken for high flow as they stand in the context of the whole eye care pathway in the system.

8. Expecting the unexpected

Health care is unpredictable and patients initially thought to be suitable for high flow services may subsequently be identified during as not suitable, have an unexpected issue with their eye condition or may become unwell whilst on site. They may have a concern about their eye condition that needs to be discussed urgently with a senior clinician. It is important that there are processes, documented in SOPs and understood by all assessing staff, as to how to identify issues and red flags, or patient concerns

that need to be dealt with quickly, and staff know how to proceed or get help and input from more senior clinical staff. This might require some space in the hub to take the patient out of the standard pathway flow and spend more time with them, whilst allowing other patients to be seen. The diagram below illustrates how Moorfields have been thinking about tackling this problem:



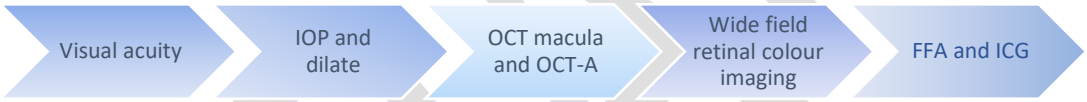
Further materials:

Example diagnostic bundles: FOR ILLUSTRATION ONLY

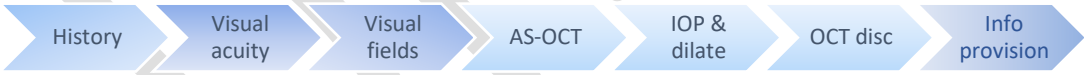
Medical retina e.g. new AMD and Diabetic Macular Oedema, injection pathway, vitreoretinal macular pathology

Medical retina e.g. retinal vein occlusion, diabetic retinopathy and vitreoretinal

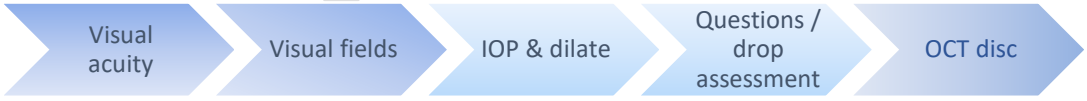
Medical retina e.g. central serous retinopathy (CSR), potentially ischaemic diabetic retinopathy or retinal vein occlusion



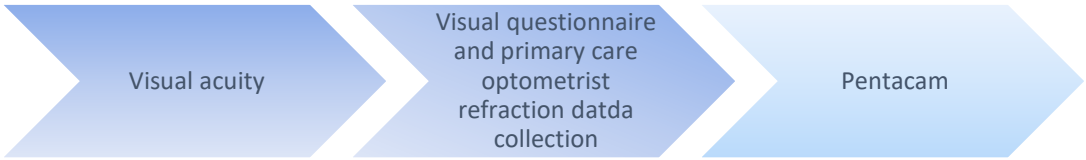
Glaucoma new



Glaucoma follow-up



Keratoconus



Neuro-ophthalmology

Oncology

Extract of the Ophthalmic and Vision Science Framework
Technical Competencies (up to band 5)

Technique/ Equipment	Assistant OVS (Band 3)	Associate OVS (Band 4)	OVS practitioner (Band 5)
Topcon Colour fundus	Y	Y	Y
Topcon OCT imaging	Y	Y	Y
Spectralis OCT	Y	Y	Y
Zeiss Angio OCT	Training	Y	Y
Anterior Segment OCT	Training	Y	Y
Goldmann Bowl perimetry	Training	Y	Y
Static perimetry (Humphrey)	Training	Y	Y
Octopus Perimetry	Training	Y	Y
Optos/Zeiss WF Imaging	Training	Y	Y
Pentacam	Training	Y	Y
Biometry	Training	Y	Y
Autofluorescence	Training	Y	Y
Slit lamp imaging	Training	Training	Y
Fluorescein/ICG Angiography	No	Training	Y
Indocyanine green angiography	No	Training	Y
Basic Ultrasound	No	Training	Y
Clinical/Studio photography	No	Training	Y
Keratography	No	Training	Y

No = Staff at this level should not be performing this activity.

References

Eye Care Roadmap; Available on the NHS England and Improvement Eye Care Hub. https://future.nhs.uk/ECDC/view?objectId=22317360

NHS England and NHS Improvement Board meetings held in common NHS England and NHS Improvement Date: 201001 Ref: BM/20/25(Pu) Paper Title: Diagnostics: Recovery and Renewal. https://www.england.nhs.uk/wp-content/uploads/2020/10/BM2025Pu-item-5-diagnostics-capacity.pdf

Diagnostics recovery and renewal. Sir Mike Richards, 2020. https://www.england.nhs.uk/wp-content/uploads/2020/10/BM2025Pu-item-5-diagnostics-recovery-and-renewal.pdf

Welsh diagnostic centres

Developing community eye care: the evolution of Wales' eye care services
David O'Sullivan. Eye News Volume 26 (6) APRIL/MAY 2020.

A review of ophthalmic diagnostic and treatment centres. 2018. https://cwmtafmorgannwg.wales/Docs/Primary%20Care%20Committee/011%20July%2024%202019/4.6.1%20Appendix%201%20ODTC.pdf

Written Statement: Introduction of a new eye care digital system and transformational funding for eye care services. Vaughan-Gething, Minister for Health and Social Service, Wales. https://gov.wales/written-statement-introduction-new-eye-care-digital-system-and-transformational-funding-eye-care

First of its kind specialist eye centre launches in Newport. 02 September 2016, Aneurin Bevan University Health Board. http://www.wales.nhs.uk/news/42544.