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Friends of Moorfields Eye Hospital

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Moorfields and the future of eye care

Martin Kuper, MEH chief executive
4 November 2023

My background

Anaesthetist and intensive care doctor
Medical device innovation
***found* isolated innovation –makes no difference to outcomes in practice**

Anaesthetic National Clinical Advisor on Enhanced Recovery surgical pathways 2009-13

Improve outcomes - tightly couple innovation to defined pathways of care

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The challenges and opportunity for Moorfields

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Five challenges: the case for change

1. People's sight matters
2. Increasing burden of disease, ageing population with more diabetes
3. The biggest outpatient speciality
4. People are suffering avoidable sight loss
5. Workforce struggles are universal

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Use old slide with IHI branding

Opportunity – deliver high value pathways

Value = outcomes (quantity and quality) / cost

Aim = high value pathways

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Principles for high value pathways

1. Save patients' time
2. Save patients and staff travel miles
3. Use staff at top of license
4. Right patient, right place, first time
5. Minimise complications
6. Minimise rework – eg rebooking outpatient slots
7. Increase equity, patients and staff

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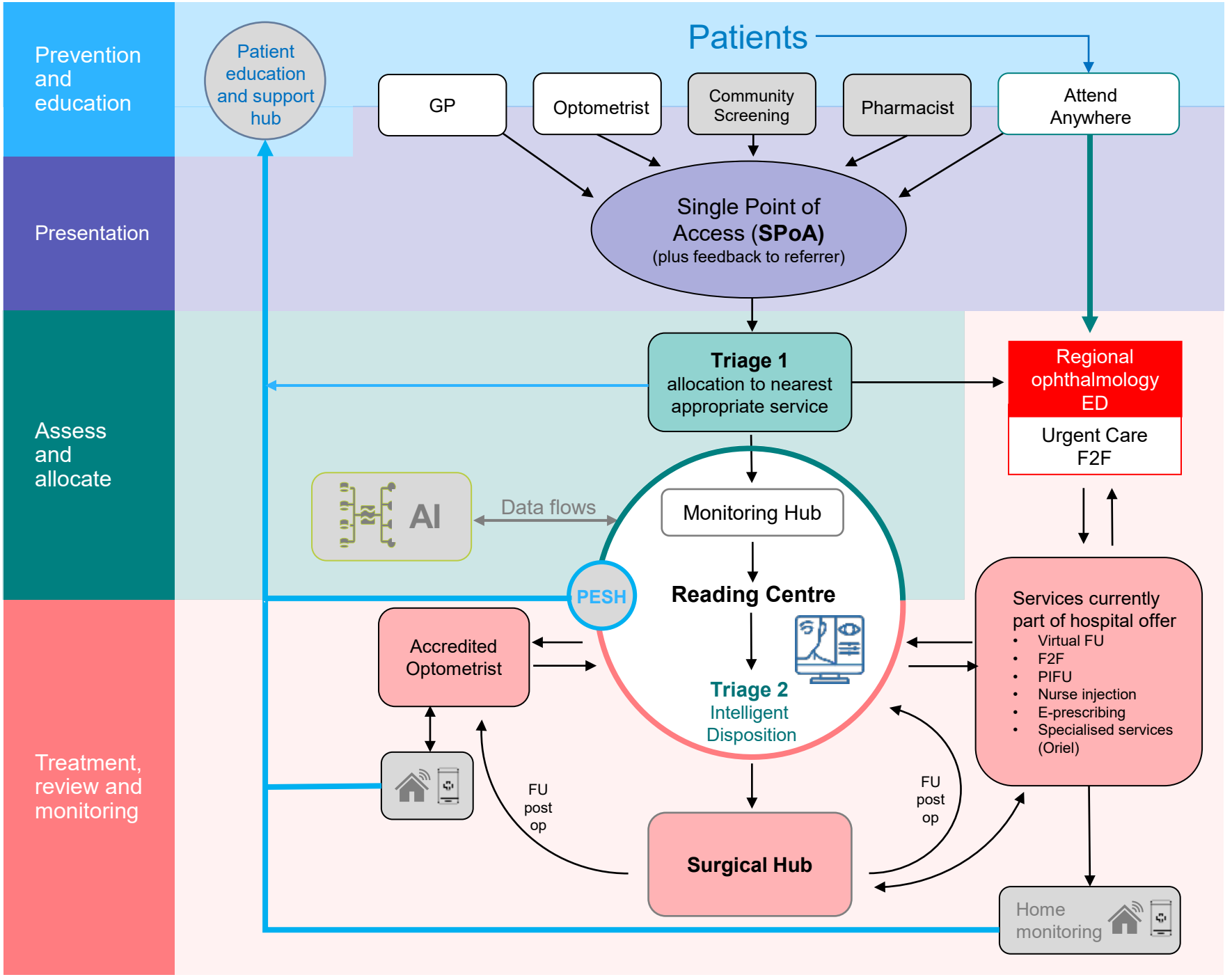
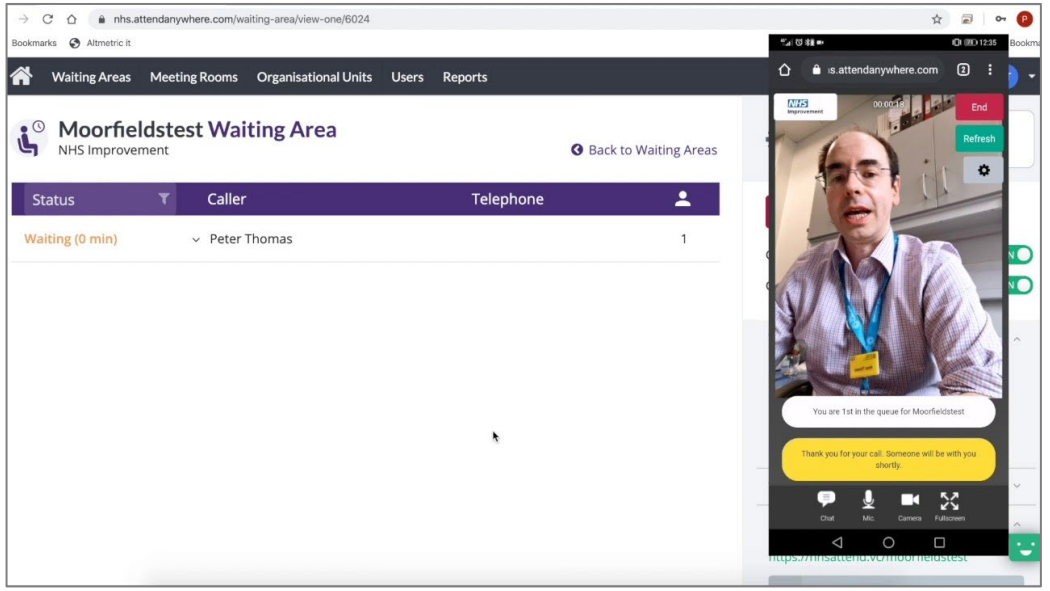

Prevention and education
Presentation
Assess and allocate
Treatment, review and monitoring
Patient education and support hub
Patients
GP
Optometrist
Community Screening
Pharmacist
Attend Anywhere
Single Point of Access (SPoA)
(plus feedback to referrer)
Triage 1
allocation to nearest appropriate service
Regional ophthalmology ED
Urgent Care F2F
AI
Data flows
Monitoring Hub
PESH
Reading Centre
Triage 2
Intelligent Disposition
Accredited Optometrist
Services currently part of hospital offer
Virtual FU
F2F
PIFU
Nurse injection
E-prescribing
Specialised services (Oriel)
FU post op
FU post op
Surgical Hub
Home monitoring

Regional urgent eye care

Video consultation – ‘attend anywhere’

- 26,000+ patients used the virtual A&E
- 95% of patients gave a 5* rating
- safety comparable to in-person triage
- Recent disposition proportions;
  - 20% advised to attend in person that day
  - 30% brought in for urgent outpatients
  - 50% do not attend hospital ie stay home, local pharmacy, optical shop or family doctor
- Scalable model…

Virtual A&E

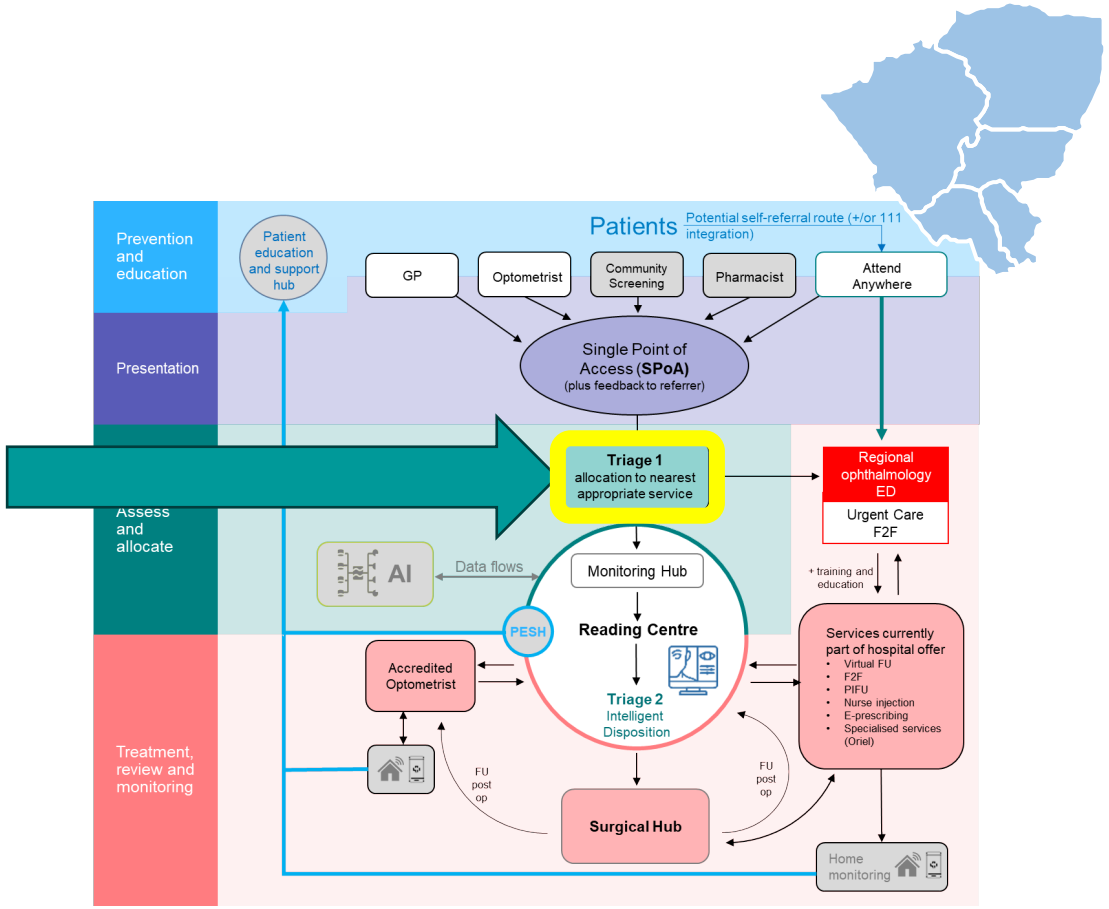


North Central London Integrated Care System

Single Point of Access (SPA) – triage 1

London region roll out, to 4 Integrated Care Boards (ICBs)

- Last year Moorfields supported a pilot of centralised triage in North Central London
- By receiving all referrals for an area, we can understand demand and inform population health planning and use capacity across a system more effectively
- We are now rolling out across the capital in partnership with other providers



Regional monitoring hub

Covid drove asynchronous diagnostic hubs for

- first line investigation of lower risk new and follow up patients
- remote diagnostic review and stratified follow up

This is now our standard operating model

- Hoxton saw 16000 patients in 2021
- Brent Cross HERCULES research project
  - Varying layouts impact efficiency and satisfaction
  - 25% of new patients in a diagnostic hub can be discharged and saved a hospital visit

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NIHR | National Institute for Health and Care Research

UCL

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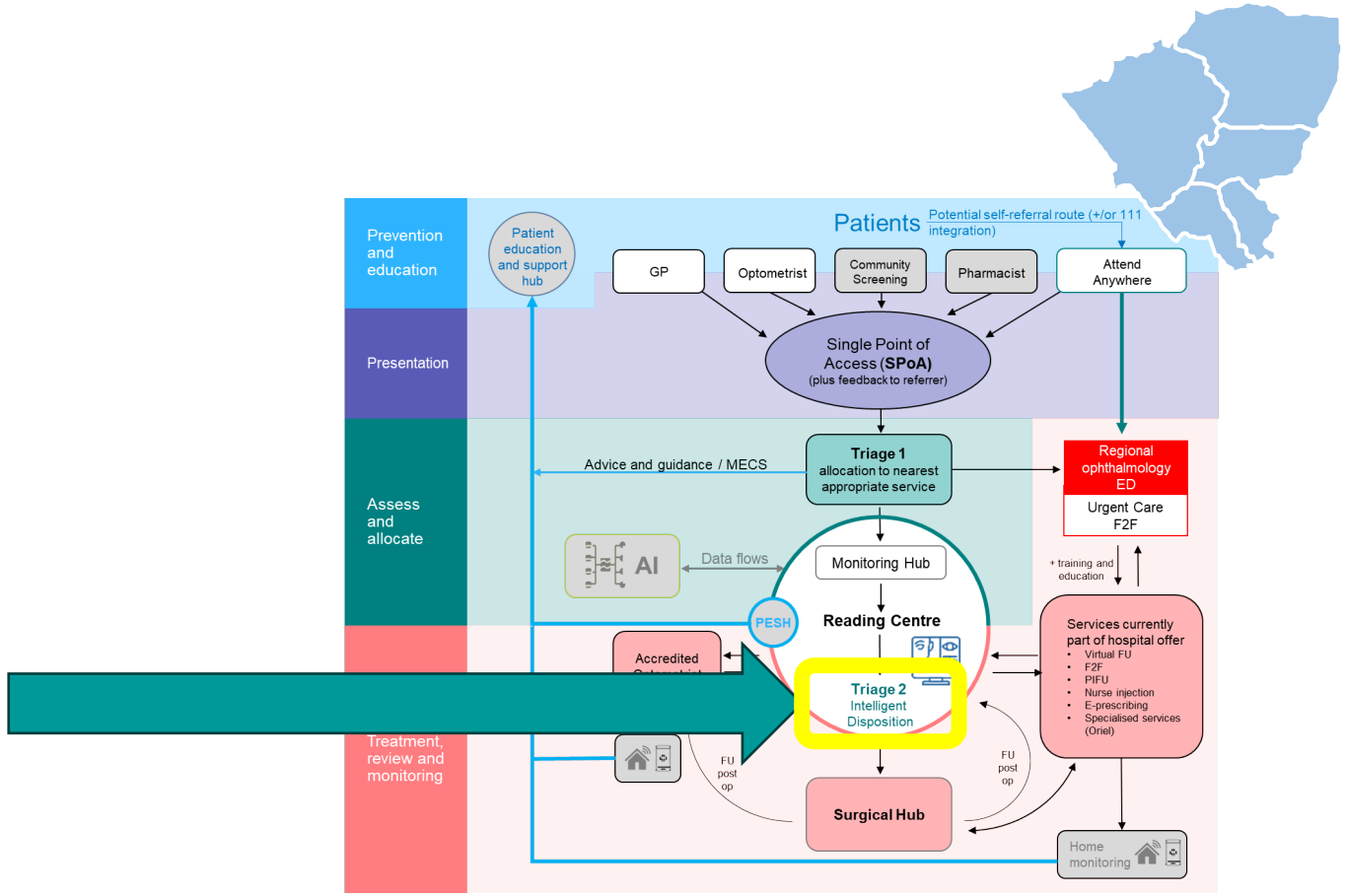
Regional digital hub: triage 1

North Central London Integrated Care System

- There are some patients with red flag symptoms who need to be seen urgently face to face
- Most patients can be safety seen in a monitoring hub
- After they have their tests done, these are reviewed later or ‘asynchronously’
- We can then send patients to the most appropriate place with a much firmer idea of what is wrong with them and what needs to happen next



Multi-professional review of diagnostic images

A model for the future - Moorfields Ophthalmic Reading Centre

- Reads scans independently for research studies
- Rapid review of diagnostics
- Multi-professional competency-based readers
- Learning should inform future large scale diagnostic reading systems

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Octane algorithm for ‘OCT’ scan diagnosis

- developed by Pearse Keane with Deep Mind and Google
- aiming for registration and clinical use within 2 years

nature medicine
ARTICLES
https://doi.org/10.1038/s41591-018-0107-6

Clinically applicable deep learning for diagnosis and referral in retinal disease

Jeffrey De Fauw[1], Joseph R. Ledsam[1], Bernardino Romera-Paredes[1], Stanislav Nikolov[1], Nenad Tomasev[1], Sam Blackwell[1], Harry Askham[1], Xavier Glorot[1], Brendan O'Donoghue[1], Daniel Visentin[1], George van den Driessche[1], Balaji Lakshminarayanan[1], Clemens Meyer[1], Faith Mackinder[1], Simon Bouton[1], Kareem Ayoub[1], Reena Chopra[2], Dominic King[1], Alan Karthikesalingam[1], Cían O. Hughes[1,3], Rosalind Raine[3], Julian Hughes[2], Dawn A. Sim[2], Catherine Egan[2], Adnan Tufail[2], Hugh Montgomery[3], Demis Hassabis[1], Geraint Rees[3], Trevor Back[1], Peng T. Khaw[2], Mustafa Suleyman[1], Julien Cornebise[1,3,4], Pearse A. Keane[2,4*] and Olaf Ronneberger[1,4*]

The volume and complexity of diagnostic imaging is increasing at a pace faster than the availability of human expertise to interpret it. Artificial intelligence has shown great promise in classifying two-dimensional photographs of some common diseases and typically relies on databases of millions of annotated images. Until now, the challenge of reaching the performance of expert clinicians in a real-world clinical pathway with three-dimensional diagnostic scans has remained unsolved. Here, we apply a novel deep learning architecture to a clinically heterogeneous set of three-dimensional optical coherence tomography scans from patients referred to a major eye hospital. We demonstrate performance in making a referral recommendation that reaches or exceeds that of experts on a range of sight-threatening retinal diseases after training on only 14,884 scans. Moreover, we demonstrate that the tissue segmentations produced by our architecture act as a device-independent representation; referral accuracy is maintained when using tissue segmentations from a different type of device. Our work removes previous barriers to wider clinical use without prohibitive training data requirements across multiple pathologies in a real-world setting.

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INSIGHT: harnessing health data at scale

INSIGHT Health Data Research Hub

INSIGHT, founded in 2019 by Moorfields and University Hospitals Birmingham, is **the world's largest ophthalmic imaging bioresource**

>2million patients with **>25million images** and linked longitudinal data including systemic data

Insight comprises anonymised eye-imaging data from the NHS, for **discovery, innovation and care**

INSIGHT is **inclusive by design**, enabling the development and testing of AI solutions that work across the diverse UK population.

INSIGHT is underpinned by public trust, with patients and public sitting on a Data Trust Advisory Board to independently scrutinise data access requests.

INSIGHT is scalable

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NHS University Hospitals Birmingham NHS Foundation Trust

HDRUK Health Data Research UK

How we will deliver care

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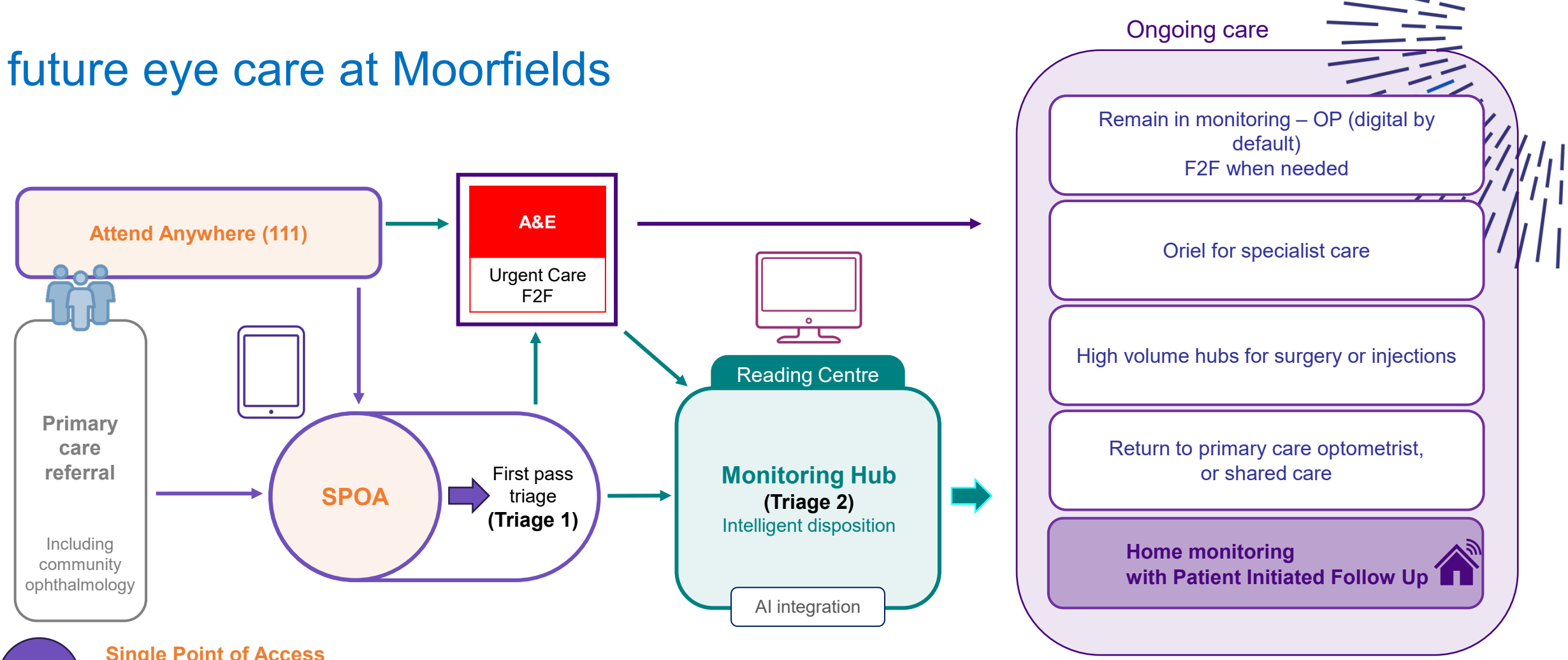
future eye care at Moorfields



1 **Single Point of Access**
Allows all referrals for an area to be safely and effectively triaged

2 **Triage 2: The real advance would be for universal 2nd triage after diagnostic or monitoring tests are done**
patients get treated in the right place, first time

3 Ongoing care, at or close to home when possible, saving patients time

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Oriel – specialist care of complex patients

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Sector hubs - many patients closer to home

New hub in Stratford
Outpatient care
Injections
Cataract surgery

Excellent transport links and accessibility

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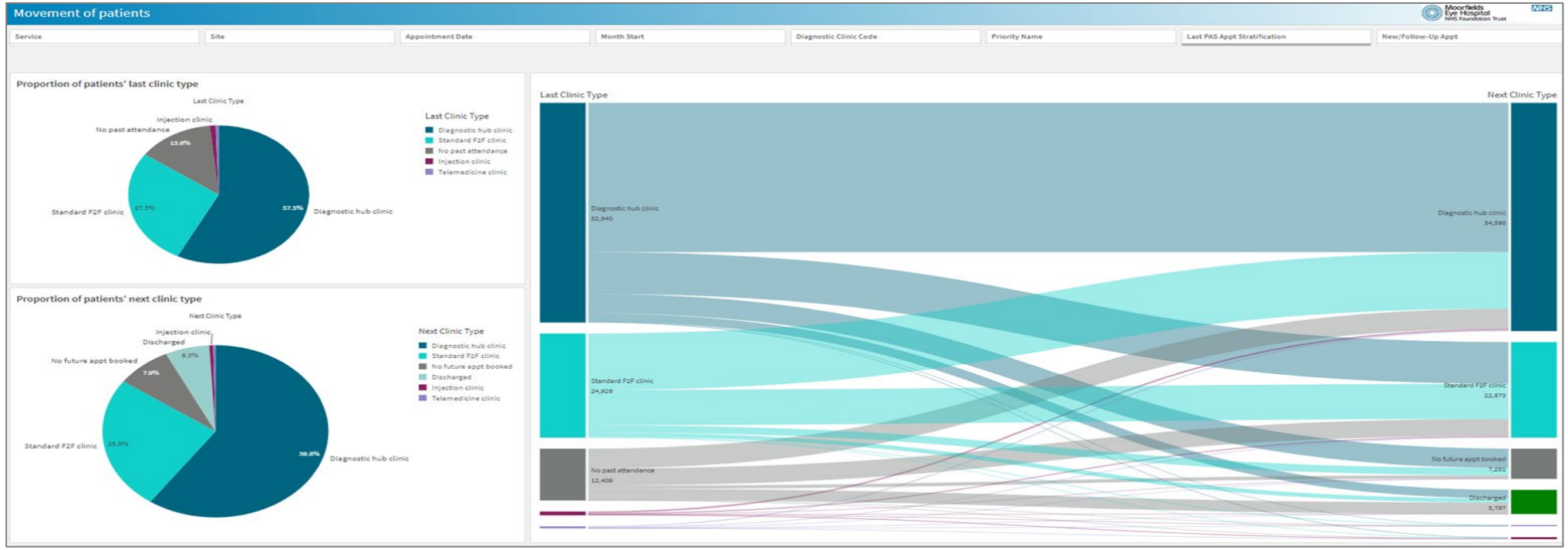
Virtual care for many patients



Some patients seen by video consultation

Some seen again in monitoring hub

- ***How do we best reassure these patients?***

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Future Eye Care

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Future eye care - specialist care at scale

Innovative and world leading use of technology
- provide expert care to more people

How do we deliver future care in line with our values?
- excellence, equity and kindness

Friends of Moorfields can help

- ***patients make the transition from City Road to Oriel***
- ***deliver virtual care with humanity and access to support***

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