



RESEARCH ARTICLE

Transformational change in care pathways & the impact on service outcomes post Covid-19 pandemic

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 OPEN ACCESS

PUBLISHED

31 August 2024

CITATION

Sharma, B., et al., 2024. Transformational change in care pathways & the impact on service outcomes post Covid-19 pandemic. Medical Research Archives, [online] 12(8).

<https://doi.org/10.18103/mra.v12i8.5526>

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DOI

<https://doi.org/10.18103/mra.v12i8.5526>

ISSN

2375-1924

ABSTRACT

Background: COVID-19 caused disarray in global healthcare systems. Ophthalmology elective outpatient services which accounts for 10% of all hospital outpatient services were shutdown resulting in a significant backlog of patients with sight threatening consequences. Vulnerabilities within our healthcare systems were brought to light, demonstrating the need for transformational change in the delivery of care. Worcestershire Acute Hospitals NHS trust established first diagnostic hubs in Midlands for ophthalmic service to restructure its ophthalmology service delivery using the Covid-19 special funding. There is paucity of data on the efficacy of setting up diagnostic hubs in ophthalmology delivering efficient virtual clinics in glaucoma service.

Aim: To assess the impact of diagnostic hub by measuring the slippage in follow up appointments after setting up the diagnostic hub & virtual glaucoma service after pandemic in July 2020

Methods: This is an observational study comparing delays in follow up appointments before Covid-19 and post-Covid-19 set up of a diagnostic hub for data collection and enhanced use of the virtual clinics in glaucoma service at Worcestershire Acute Hospitals NHS Trust. We compared the Slippage (delay beyond the clinically suggested interval) in follow up appointments and stability of visual fields to assess the efficacy of a diagnostic hub and new virtual clinic service.

Result: The slippage of more than 3 months in appointment has reduced from 94% in 2020 to 20% in 2023. The visual field stability had significantly improved to 89.8% in 2023 from just 2% in 2020. This significant improvement is a direct result of setting up of diagnostic hub delivering efficient virtual glaucoma service.

Conclusion: This study clearly demonstrates the positive impact of transformational change in healthcare delivery by setting up a diagnostic hub for ophthalmology. This study supports that building this capacity is important to reduce how long people are waiting for treatment. The reduced delay in treatment has led to improved clinical outcomes.

Introduction

The COVID-19 pandemic caused a crisis in the healthcare services worldwide. The rapid spread of COVID-19 made strict control measures a requisite, causing delays and cancellations in routine and elective appointments. Healthcare provision had reduced by a third, with many specialities providing only emergency and urgent care. This resulted in cancellations of most elective clinical work¹. The impact on waiting times for review and surgery has been profound². In October 2021 the UK government announced plans for new community diagnostic centres (CDCs) across England³ as more than 85% of patients seeking NHS care require diagnostics test⁴. Glaucoma is a chronic condition and thus, once patients are diagnosed, require lifelong follow up. The UK has the one of the lowest number of ophthalmologists per capita within the developed world⁵. The demand for glaucoma service capacity has been outstripping its supply, even before Covid-19, which presented additional logistical problems. Across the world, healthcare providers innovated the way in which care is provided, such as telemedicine and virtual consultations to accommodate for reduced in-person consultations. Worcestershire Acute Hospital NHS Trust saw a huge need to redesign glaucoma patient pathways to improve capacity⁶. Our trust management team realised the potential of diagnostic hubs immediately after Covid-19 and used part of the extra Covid-19 funding given by central government to redesign the glaucoma and medical retina services by creating a diagnostic hub in a local community hospital in Bromsgrove.

In this article, we describe what changes were made to the service delivery and assessed the impact of such changes on the follow delays.

Methods

Glaucoma patients were previously seen in the Worcestershire Acute Hospital NHS Trust in general face to face eye clinics. The capacity in these clinics was very limited as glaucoma patients were usually not considered high priority for the limited number

of appointments available as glaucoma cases were not at risk of immediate sight loss. The hospital management always prioritised patients in Age-related macular degeneration service over other services due to the risk of imminent visual loss. This has led to further delays in follow up appointment in glaucoma service.

SETTING UP THE HUB:

We created a data capture (diagnostic) hub at The Princess of Wales Community Hospital and Minor Injury Unit in Bromsgrove. We wanted to create a COVID-19 safe patient pathway so that patients can be seen in a socially distanced format. We needed extra rooms where other clinical services used to operate. Due to inactivity during COVID-19, other services were not using these rooms. We used proper communication channels inside our trusts management structure and sought approval from other services to move to area vacated by our team in nearby hospital. It was a mutually beneficial space reallocation. We applied to trust board to invest part of the COVID-19 funding provided by the UK government in ophthalmology service. Trust board approved the allocation of £330000 to invest in the diagnostic hub. We still needed more equipment which we relocated from other site vacated by our department. The next big challenge was to convince staff to change the way they work including their job plan and their designated sessions. This was achieved through constructive dialogue and goodwill of the staff. The structure of the new pathway is shown in the figure 1.

All referrals sent by either Primary care general practitioners (GP), optometrist or referrals sent by hospital eye services were triaged by our trained medical team. All suitable patients were offered appointment at the data capture diagnostic hub for all the clinical diagnostic tests. On arrival to the hub, patients go with the designated nurse. A Data capture clinic collects a history questionnaire, carries out basic Eye examination (VA and pressure and conducts diagnostic test like visual Field exam and optic disc & macula assessment with Optical

Coherence Tomography). The nurses take patients through a series of rapid tests which are all completed within a 45-minute visit. Once seen in the diagnostic clinic each patient’s assessment is then individually reviewed virtually by the medical team within a defined period of 1 weeks and a plan for ongoing care is formulated. The virtual review is largely possible due to excellent electronic medical record and Information and technology facility in our trust. Patients will then receive a letter informing them of

the outcome of their tests, while some will be offered a telephone appointment to discuss particular results and their treatment plan. If the visual parameters are stable, patient will be booked for virtual review clinic at suitable interval as per NICE (National Institute of Clinical Excellence). Patients will only be asked to attend a subsequent hospital visit if they either need gonioscopic /peripheral retinal examination or if the patient needs laser or surgical intervention.

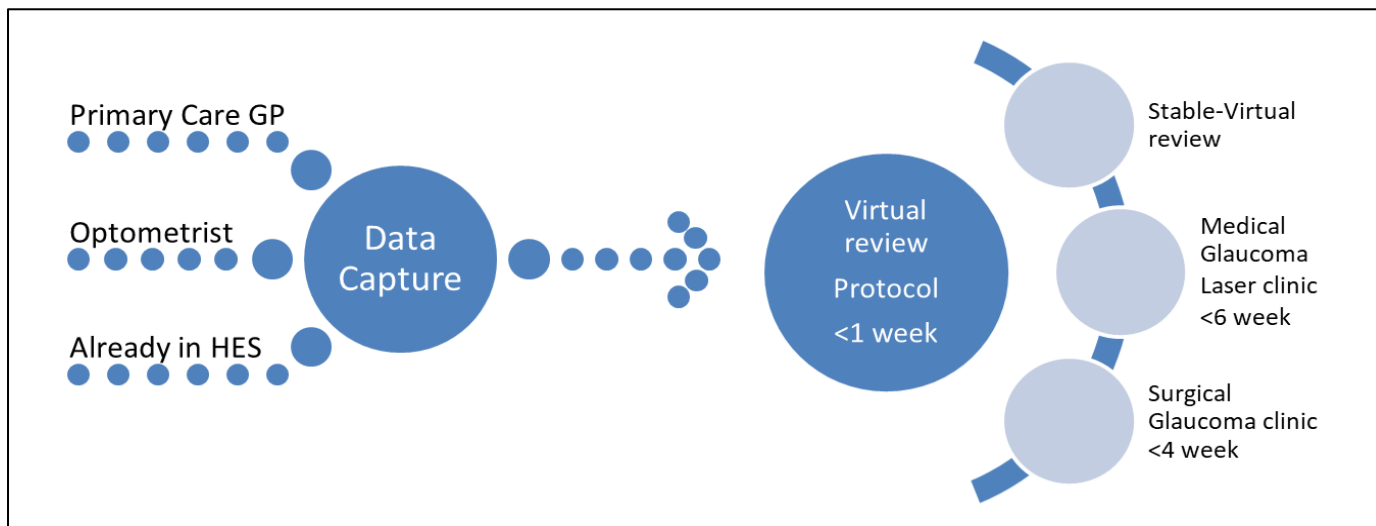


Figure 1. The structure of the new pathway

Impact assessment

We compared the clinical data for patients coming to glaucoma service before & 3 years after the diagnostic hub. The time periods included were from 1st June to 30th June 2020 & between 9th November and 1st December 2023. Data collected included: Demographic Data, Age, Ethnicity, Sex, Geography, Snellen visual acuity, Visual field (Mean Deviation). We define appointment slippage as the delay of the number of months between requested follow up at the last appointment and the current follow-up appointment date. We used a student T test to measure the statistical significance.

Results

We collected the data of 100 consecutive patient coming to glaucoma service in between 1st June 2020 till 30th June 2020. To assess the impact of the diagnostic hub, we repeated the similar data collection between 9th November 2023 & 1st December 2023. The Mean age was similar in two groups (71.51± 5.4 in 2020 vs 72.34± 4.8 in 2023). There was no difference with regards to Male to female ratio and the racial distribution between the two groups (Figure 2).

	2020	2023
Mean Age in years	71.51± 5.4	72.34± 4.8
Gender M/F %	51/49	48/52
Ethnicity in % Caucasian / Non-Caucasian	96/4	96/4

Figure 2.
Slippage in appointment

The slippage (delay beyond the clinically suggested appointment date) was calculated and compared between the two groups. Covid-19 related disruption had major adverse impact on already compromised NHS glaucoma services across whole of UK (7). Figure 3 shows that immediately after the first wave of Covid-19, 94% patients in our hospitals had a slippage of more than 3 months. 12% patients had a delay of up to 2 years from the clinically suggested

time. The impact of the diagnostic hub is clearly visible as there were 58% who were seen at the clinically recommended time in 2023. 80% of the patients were seen within 3 months. Only 20% had appointment delay of more than 3 months in 2023 in comparison to 94% before the diagnostic hub. Ideally the slippage should be 0.00% which means that all patients are seen at the clinically recommended interval.

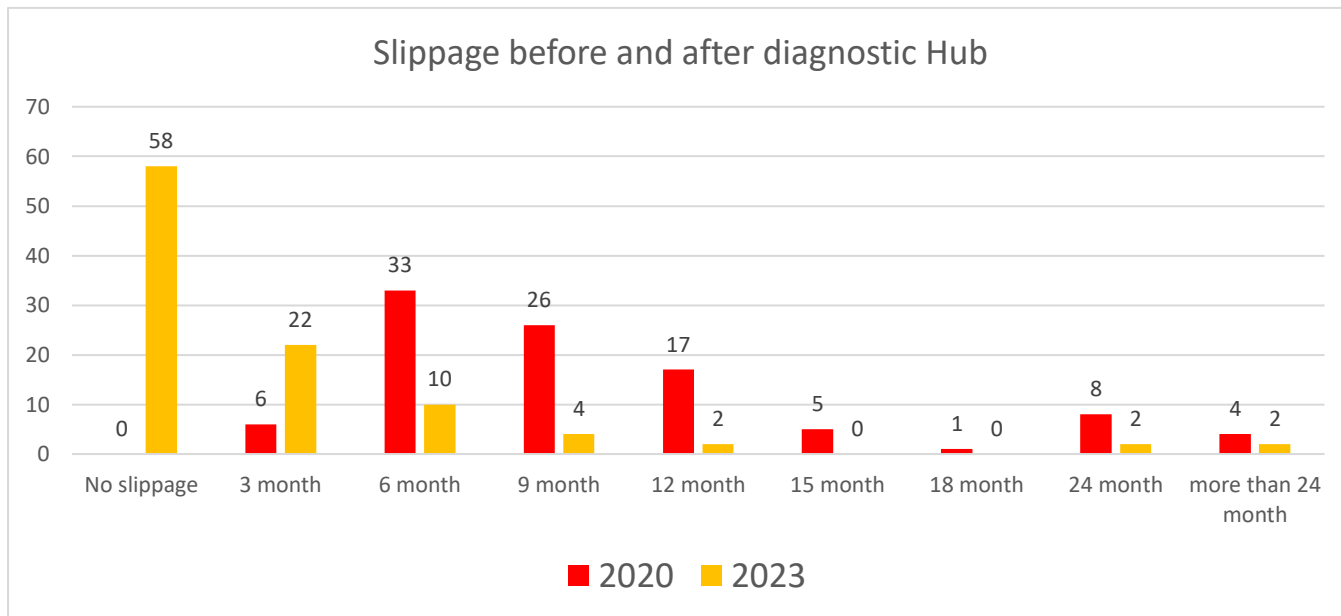


Figure 3. Improvement in slippage (Follow up delays) after diagnostic hub

VISUAL FUNCTION STABILITY

We compared visual field stability in 2020 and 2023 (Figure 4). Immediately after Covid-19, there were significant delays in clinic appointment as there were no face to face clinics from 23rd March for 2 months.

In June 2020, we restarted a limited face to face glaucoma service. 98% of cases had shown worsening of their visual fields. In 2023, this number had reduced to 11.2% while 89.8% had shown stability in visual function ($p < 0.05$).

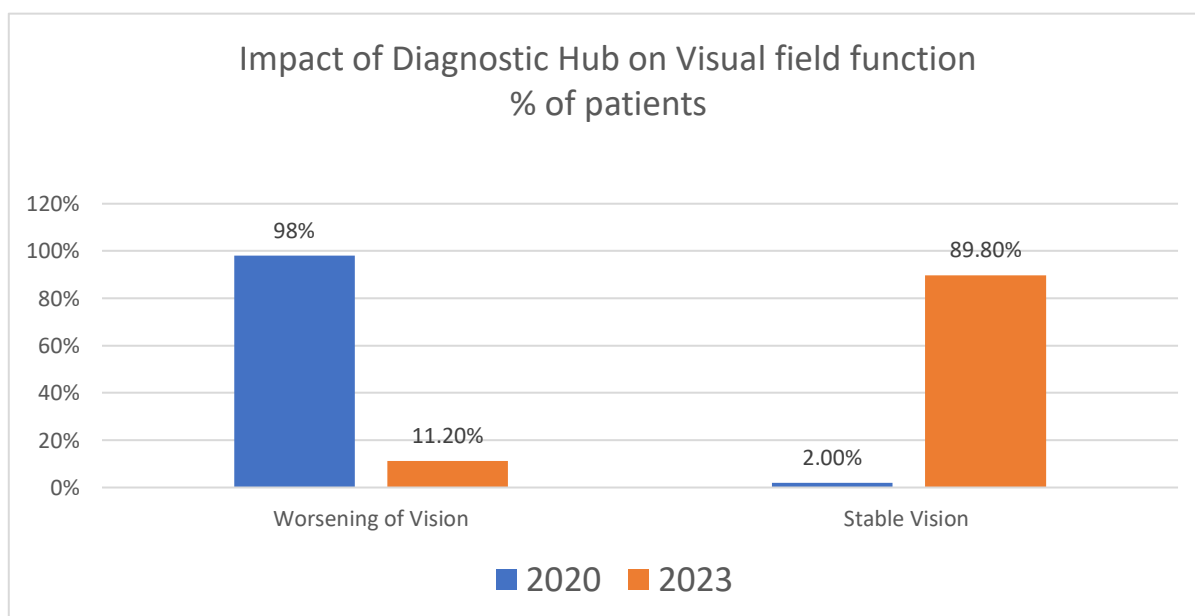


Figure 4. % of patient showing worsening & stability of visual field mean deviation

Discussion

Delayed follow-up in glaucoma is a preventable cause of loss of vision as reported by Tatham et al in 2012^{7,8}. Hospitals management have been prioritising new referrals over reviews due to the requirements to meet the 18-week referral to treatment targets (RTT) leading to long delays in follow up cases⁹. Review patients have confirmed pathology thus are significantly more likely to suffer vision loss due delays in follow-up appointment⁸. Loss of vision adversely affects both physical and mental health. It is well recognised that those with sight loss are more likely to suffer falls,^{10,11,12} depression,¹¹ and to become dependent on social services at an earlier stage.

The Covid-19 pandemic had huge impact on clinical services in all the specialities of medicine. Prior to the pandemic in February 2020, there were already 4.43 million people on a waiting list for consultant-led care. Figures for March 2024 shows that the waiting list stood at 7.54 million cases, consisting of approximately 6.29 million individual patients waiting for treatment¹³. Szegedi et al¹⁴ showed the adverse impact of covid-19 on the outcomes in age related macular degeneration service in ophthalmology.

Post-Covid-19, it was felt that a change in the care pathway is essential to deliver improvement in the follow up delays in ophthalmic service. The concept of community diagnostic centres developed in last decade^{15,16,17}. These diagnostic centre aim to provide patients with quicker and more convenient direct access to diagnostic services and reduce pressure on hospitals. There is still a paucity of data on their effectiveness and cost-effectiveness. In ophthalmology, we are among the first few diagnostic centres developed for glaucoma and medical retina. We set our diagnostic centre in the community hospital where it is supposed to be more effective than one in main hospital services^{16, 18}.

While setting up our diagnostic hub, we wanted to cross the quality chiasm by significant improvements in 6 elements of our performance: safety, effectiveness,

patient centeredness, timeliness, efficiency, and equity. This new nurse-led approach reduces the time each patient spends in the clinic and aims to improve the patient experience (patient centred). The diagnostic clinic has capacity for 280 appointments per week (timeliness & efficiency), which allows for more patients to be seen in a socially distanced format (safety), but also frees up consultants for those patients who require specialist care or face-to-face appointments (equity). It effectively doubled the capacity in our service (effectiveness). The reduced slippage and increased stability shows a safer and effective care pathway. The key improvement in reduced slippage from 94% to 20% has resulted in higher proportion of patients with stable vision from 2% to 89.8%. This also should result in lower complaints, litigation costs and improved morale amongst the staff who feel that they are part of high-quality service delivery. Our study is amongst the first few to show the impact of a diagnostic hub on clinical outcome. This study demonstrated an emergence of an entirely new care pathway through the collective focus of all stakeholders, constructive dialogue & negotiations with different staff groups leading to effective business case approval and investment. This transformational change resulted in a profoundly different structure, culture and level of performance leading to improved patient outcome and experience.

Conflict of Interest Statement:

None

Acknowledgements:

None

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