Future Healthcare Journal 11 (2024) 100019

Contents lists available at ScienceDirect

Future Healthcare Journal

journal homepage: www.elsevier.com/locate/fhj

QI short report: Virtual clinics are a safe and efficient method of expanding the hospital diabetic retinopathy service

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ARTICLE INFO

Keywords:
Diabetic retinopathy
Virtual
Clinic
Capacity
Expansion

ABSTRACT

Demand for hospital diabetic retinopathy (DR) appointments is increasing and exceeding capacity, leading to long waiting lists. Delays in appropriate treatment can cause irreversible yet avoidable vision loss. We assessed if capacity of the DR service could be safely expanded by utilising virtual clinics. Virtual clinics increased the service capacity by more than 100% and did not cause delays in delivering urgent treatments. The majority of patients reviewed had low-risk disease and follow-up could be maintained in the virtual clinic.

Introduction

Diabetic retinopathy (DR) is a sight-threatening complication of diabetes. National eye screening programmes refer to hospital services according to disease severity, the most advanced being proliferative DR.[1] The increasing prevalence of DR places increased demand on hospital services.[2] Virtual clinics utilised in other hospitals for both medical retina and DR patients were proven to be a viable method of alleviating demand without reducing the quality of care.[3,4]

At our district general hospital in south Wales, staff shortages led to a lack of regular dedicated DR clinics for 2 years with resultant long waiting times for new and follow-up appointments. In 2019 the mean wait for new patients was 336 days with a maximum wait of 1,525 days. For follow-ups, the mean delay beyond the intended follow-up interval was 616 days with a maximum delay of 1,461 days. In April 2019, dedicated DR clinics were reinstated after recruitment of a new consultant ophthalmologist with face-to-face (F2F) clinic capacity of 128 appointments per month. To address the long delays, a virtual DR clinic (VDRC) commenced in October 2019. The aim was to increase the capacity of the DR service whilst ensuring this did not cause delays to urgent treatment if required.

Method

The VDRC was a nurse-led service with 20 appointments per week. Patients attended the hospital for visual acuity assessment, optical coherence tomography (OCT) scanning and fundus photography. Image capture and image review were asynchronous, with images being evaluated in a consultant virtual review clinic, generally within 1–2 weeks after the patient attended the virtual clinic. On alternate weeks, a F2F session was allocated to review any urgent patients identified from the virtual reviews.

Data from the VDRC were collected using a hybrid paper-electronic system using Microsoft Word and Excel. Clinical data were entered into a Word document proforma using content controls' whereby editable portions of the document were configured to only contain specific content from a drop-down list (Fig. 1). This proforma was printed and filed in the patient notes and an electronic copy saved securely and anonymously on a hospital server.

Using Microsoft Excel, all data from content control fields in the saved Word files could be extracted, collated and analysed in an automated process. This process enabled the collection of large volumes of data in minutes.

Data collected prospectively from the first 1,000 VDRC appointments between October 2019 and October 2021 were analysed.

Results

Patients were triaged and booked into the VDRC using the following criteria:

- Inclusion criteria
  - Visual acuity ≥6/12
  - Screening grade: R1M1, R2M0, R2M1 for new referrals and <severe non-proliferative retinopathy for FU patients

This article reflects the opinions of the author(s) and should not be taken to represent the policy of the Royal College of Physicians unless specifically stated.

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https://doi.org/10.1016/j.fhj.2024.100019

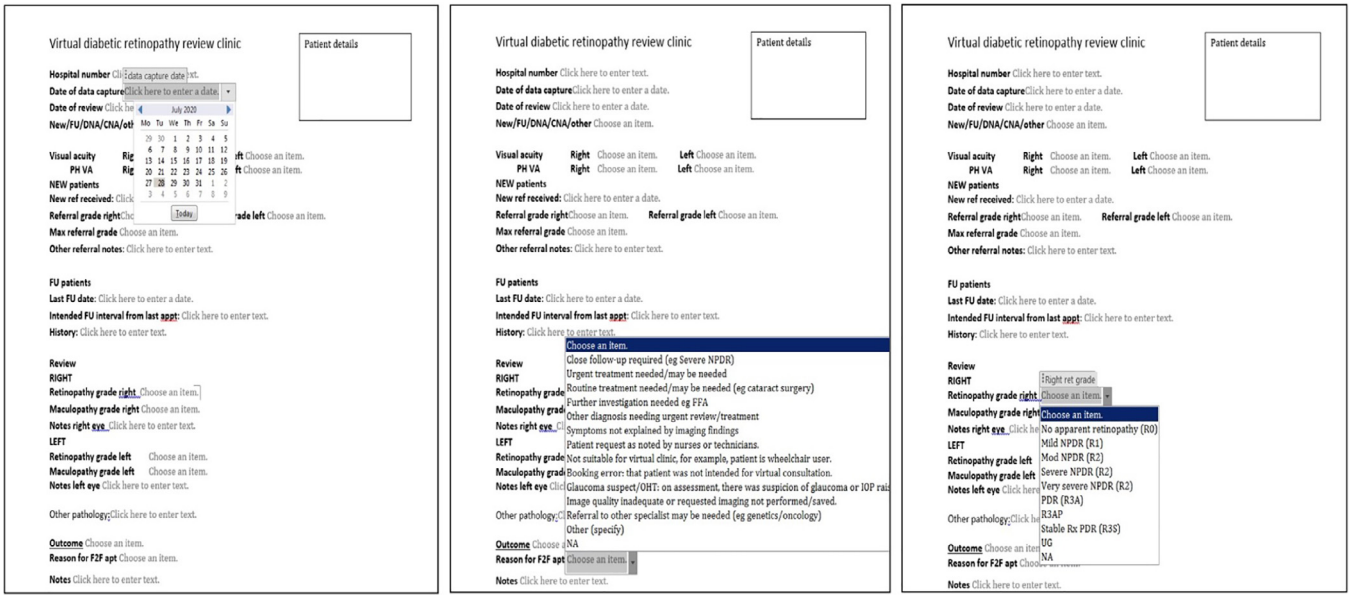

Fig. 1. VDRC proforma in Microsoft Word. Data collected prospectively using 'Content Control' fields. (Contact Corresponding author for full details of proforma.)

[NB: diabetic retinopathy screening grades R1 ~ background DR, R2 ~pre-proliferative DR, M0 = no referable maculopathy, M1 = referable maculopathy]

Exclusion criteria

- Visual acuity ≤6/18
- Ungradable images
- Referral with other pathology
- Proliferative DR
- Vulnerable adults (eg dementia)
- Other pathology identified or suspected

There were 761 patient attendances during the first 1,000 appointments (273 new, 488 FU). A mean of 16 patients were reviewed per VDRC compared to eight to nine for F2F clinics. There was a mean time from the patient attending for imaging to image review of 9.6 days. The mean monthly DNA rate was 22%. Clinics were paused between March and August 2020. Monthly DNA rates varied between 10 and 59% over the audit period.

19.9% of new patients and 34.1% of FU patients had disease graded as severe non-proliferative DR (NPDR) or worse. 3% of new patients and 7% of FU patients had proliferative DR (Fig. 2).

Following review, the majority of patients either remained in the VDRC or were discharged to community screening (59% of new patients and 56% of FU patients). F2F clinic follow-up was required by 37% of new patients and 41% of FU patients (Fig. 3). F2F review was largely required for clinical reasons (eg close follow-up of severe disease or urgent treatment needed) rather than administrative reasons (eg booking error) (Table 1).

Urgent treatment included intravitreal injections for diabetic macular oedema (DMO) or laser treatment for proliferative DR (PDR). Five patients required intravitreal injections for DMO. The mean time from VDRC review to injection was 22 days. 40 patients had suspected or definite PDR. Of these, 24 patients required laser treatment with a mean time from VDRC review to laser of 35 days.

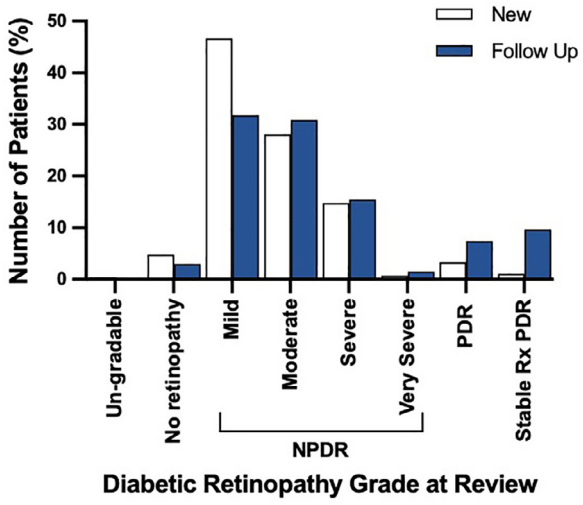

Fig. 2. Diabetic retinopathy grade diagnosed during VDRC review. Percentage with mild, moderate, severe or very severe non-proliferative diabetic retinopathy (NPDR), proliferative diabetic retinopathy (PDR) or stable treated PDR for new (white) and follow-up (blue) patients. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Discussion

VDRCs are an efficient method of service delivery; approximately twice as many patients can be reviewed per session compared with a F2F clinic. For patients with sight-threatening disease, there were no significant delays in receiving urgent treatment.

The overall DNA rate (22%) is high and reflects high DNA rates post-COVID. Pre-pandemic, the mean monthly DNA rate was 13%. For the 6 months after services restarted in October 2020, this was 30%. A survey by Ahnood *et al* suggested patients are supportive of virtual clinic models and Faes *et al* found their VDRC attendance rates similar to F2F clinics.[4,5]

Due to its success, the VDRC has been developed into a technician-led service and expanded from 80 appointments per month to 180 per month. VDRCs have more than doubled the hospital capacity for patients with DR and allows F2F capacity to be reserved for higher-risk patients.

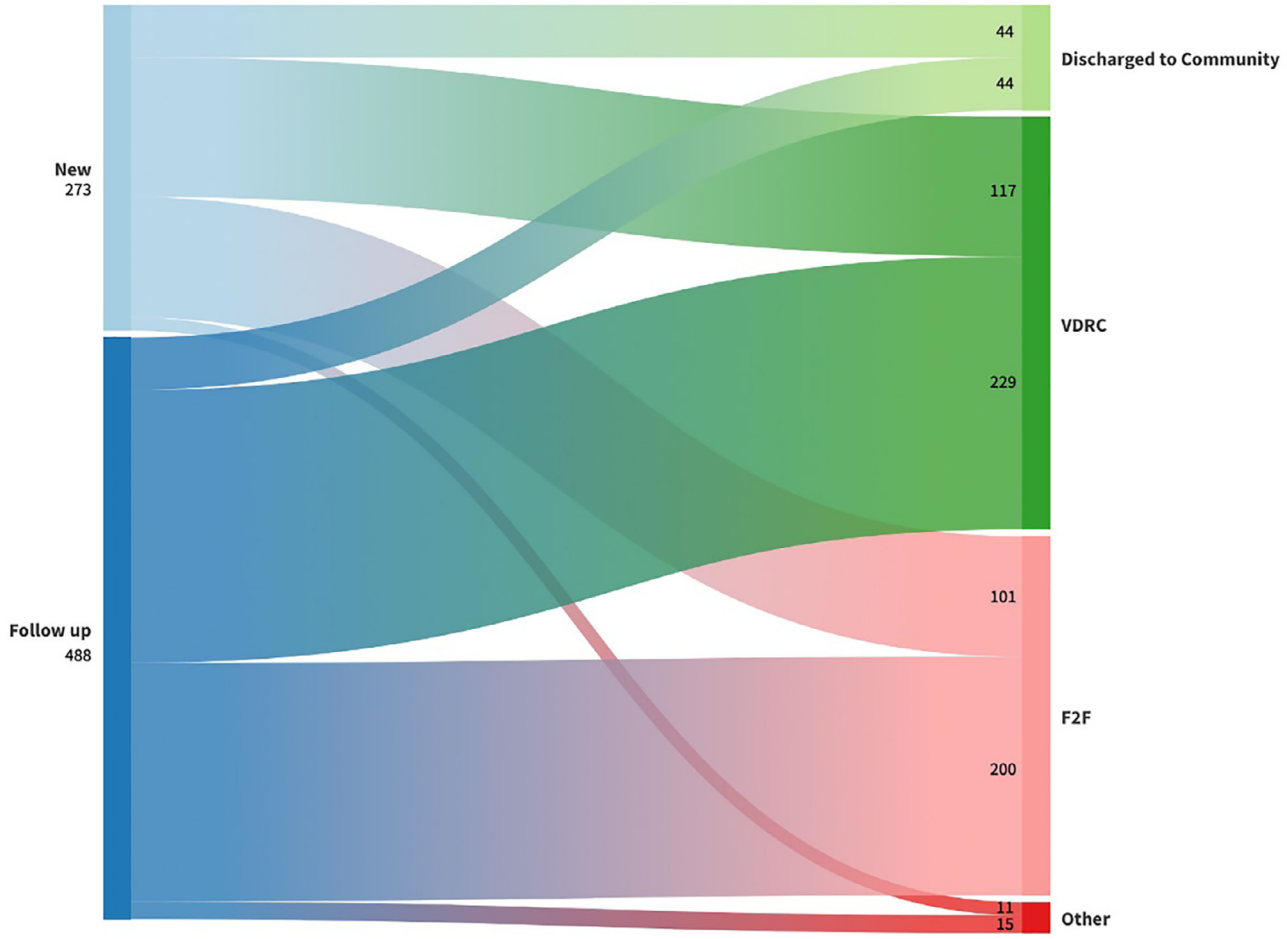

Fig. 3. Sankey diagram showing outcomes of VDRC for new and follow-up patients.

Table 1
Indications for F2F review following VDRC.

Reason for F2F Review	Number of patients (%)
Urgent treatment (may be) needed	28
Close follow up of severe disease	28
Routine treatment needed	7
Other diagnosis needing follow up	2
Further investigation needed	1
Image quality inadequate or not saved	13
Symptoms not explained by image findings	7
Booking error	5
Patient not suitable for virtual clinic	3
Other	6

Indications categorised into clinical (grey) and logistical reasons (white).

Conclusion

Lack of hospital DR clinic capacity leads to long delays and puts patients at risk of vision loss. Virtual clinics are a safe, efficient and effective way of expanding capacity of the hospital diabetic retinopathy service. Future work includes investigating patient opinions of the virtual clinic model, possibly through questionnaires.

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