Impact of the New R2L/R2H Diabetic Retinopathy Grading System on Hospital Referrals and Service workload: A Two-Year Comparative Study.

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Introduction

- In October 2024, the Diabetic Eye Screening Programme introduced a revised national referral pathway for patients graded as **R2 pre-proliferative diabetic retinopathy**.
- Previously, referral practice varied between programmes:
  - Some referred all R2 patients to the **Hospital Eye Service (HES)**.
  - Others referred only patients considered to be at higher risk.
- This variation created inconsistency between Diabetic Eye Screening Programmes and contributed to avoidable capacity pressure within HES.
- The revised pathway introduced a two-tier R2 grading system:
  - **R2L:** R2 lower-risk pre-proliferative diabetic retinopathy, usually retained within digital surveillance if there is no referable maculopathy.
  - **R2H:** R2 higher-risk pre-proliferative diabetic retinopathy, referred to HES because of higher risk of progression.
  - **Ungradable R2:** Retinal images are of insufficient quality to confidently assign the R2 grade or exclude higher-risk features; these cases may require HES assessment depending on local pathway and clinical concern.
- **R2L** is defined by the presence of **any one** of the following lower-risk R2 features:
  - 8 or more blot haemorrhages across the four quadrants.
  - More than 20 haemorrhages or microaneurysms of any size per quadrant in 1–3 quadrants.
  - Venous beading in one quadrant.
  - Intraretinal microvascular abnormalities (IRMA) smaller than **½ disc diameter** in any quadrant.
- **R2H** is based on the **4-2-1 principles**, where the presence of **any one** of the following features is sufficient to classify the eye as R2H:
  - More than 20 haemorrhages or microaneurysms in each of the four quadrants.
  - Venous beading in two or more quadrants.
  - IRMA larger than **½ disc diameter** in one or more quadrants.
- This service evaluation assessed the impact of the revised R2L/R2H pathway at **East Lancashire Hospitals NHS Trust (ELHT)** on:
  - Referral activity to HES.
  - Agreement between screening and hospital assessment.
  - Hospital management outcomes.

Methods

- A retrospective comparative service evaluation was conducted within the **Diabetic Eye Screening Programme at ELHT**
- Screening and hospital outcomes were reviewed before and after introduction of the revised **R2L/R2H referral pathway**.
- **Pre-implementation cohort:**
  - Screening period: **September 2023 to September 2024**.
  - Included patients graded **R2M0 or R2M1** under the previous DESP classification.
  - These patients were referred to the **Hospital Eye Service** under the previous pathway.
- **Post-implementation cohort:**
  - Screening period: **October 2024 to November 2025**.
  - Included patients graded **R2HM0, R2HM1**, or **ungradable R2 cases** referred to HES.
  - Included **R2LM0** patients retained within screening surveillance.
- Data sources:
  - Local diabetic eye screening databases.
  - Hospital clinical records.
- Analysis was based on the **worst eye classification**, in keeping with standard DESP referral criteria.
- Collected variables included:
  - Screening grade.
  - Maculopathy status.
  - Hospital grading
  - Management outcome.
- Referral activity before and after implementation was compared to assess the impact of the pathway change on HES workload.
- Agreement between screening grade and hospital diagnosis was reviewed to assess referral accuracy.
- Hospital documentation was reviewed to assess whether the revised terminology, particularly **R2L** and **R2H**, was used consistently after implementation.

Results

- Results are presented graphically.
- The graphs compare:
  - HES referral volume before and after implementation.
  - Screening grade distribution.
  - Hospital diagnosis and management outcomes.
- Following implementation, fewer R2 patients were referred to HES, with more lower-risk cases retained within screening surveillance.
- Most referred patients required monitoring rather than treatment.

Conclusions

- Introduction of the R2L/R2H risk-stratified grading pathway at **ELHT** was associated with:
  - Reduced referrals to HES.
  - Increased retention of lower-risk R2 patients within screening surveillance.
- The revised pathway appears to improve triage between diabetic eye screening and hospital eye services while maintaining patient safety.
- Most patients referred to HES required monitoring rather than active treatment, and some were downgraded after specialist review.
- Some patients downgraded to **R1M0** were not clearly discharged back to DESP, suggesting that referral outcomes and discharge pathways require further review.
- Hospital documentation frequently recorded the grade as **R2** only, without distinguishing between **R2L** and **R2H**.
- This highlights the need for:
  - Greater clinician awareness of the revised R2L/R2H pathway.
  - Consistent use of updated grading terminology.
  - Clearer discharge processes between HES and DESP.
- Ongoing evaluation and clinician engagement will be important to optimise implementation of the revised pathway across the screening–hospital interface.