

Implementing the Arclight device in Undergraduate Ophthalmology Education: A Prospective Quality Improvement Study

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Aim

To evaluate whether Arclight-based teaching, together with device access during placement, improves undergraduate students' knowledge, confidence and engagement in ophthalmic examination.

Background

UK undergraduate ophthalmology training is limited and variable with students reporting low confidence in ophthalmic skills particularly in direct ophthalmoscopy.¹

The Arclight device is a low-cost, portable ophthalmoscope with additional features supporting core ophthalmic examination, including anterior eye surface examination.

Undergraduate clinical use of the Arclight device remains under-explored, although one study showed improved fundus visualisation and strong medical student preference for the Arclight device in simulated settings compared with traditional ophthalmoscopes.²

Pre-intervention surveys across our two cohorts (n=81) confirmed a **significant lack of clinical experience**.

- 48% had never attempted Direct Ophthalmoscopy
- 69% had never performed an eye examination on clinical placement.
- None of our students had used an Arclight before.



Methodology

Design: Prospective Quality improvement evaluation

Participants: Fourth-year medical students at the University of Leicester, recruited as two distinct, consecutive cohorts.

Intervention: Arclight practical workshop dleivered at placement induction + device access during 1-week ophthalmology placement.

Outcome Measures:

- Self-percieved confidence in performing direct ophthalmoscopy and anterior eye surface examination (Likert 1–5).
- Knowledge scores (5 item quiz).
- Interest in ophthalmology (Likert 1–5).
- Perceived relevance to future practice (Likert 1–5).

Data collection: Pre- and post-teaching surveys, Post-placement survey.

Analysis: Wilcoxon Signed-Rank tests compared paired pre- and post-intervention scores; descriptive statistics summarised placement utilisation. Thematic analysis of open-ended responses identified benefits and barriers to clinical implementation.

References

- 1.Hussain S, Aziz R, Cheloni R, Mohyudin M. A Systematic Review of the Adequacy of Undergraduate Ophthalmology Education in the United Kingdom. Cureus. 2025 Oct 9;17(10):e94186. doi: 10.7759/cureus.94186. PMID: 41079509; PMCID: PMC12509463.
- 2.The Arclight vs. traditional ophthalmoscope: a cross-over trial Hytiris et al. <https://discovery.dundee.ac.uk/en/publications/the-arclight-vs-traditional-ophthalmoscope-a-cross-over-trial>

Results:

Figure 1:

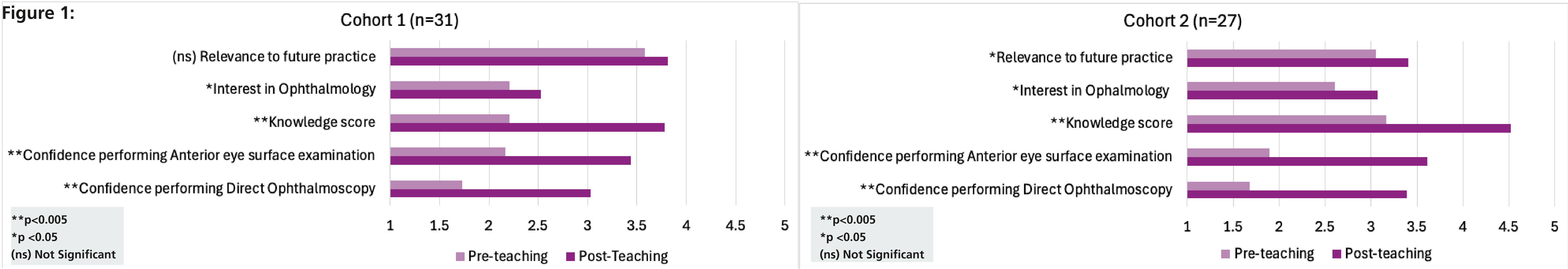


Figure 1: Wilcoxon Signed-Rank Test was performed on matched pairs (Cohort 1: n=31; Cohort 2: n=27).Both cohorts demonstrated significant gains in direct ophthalmoscopy, anterior eye surface examination and knowledge (p < 0.005). For relevance to future practice Cohort 1 resulted in a non-significant (NS) result, whereas Cohort 2 showed a significant increase in perceived clinical utility (p < 0.01).

Post-placement results

Figure 2:

Measure	Cohort 1 (n=3)	Cohort 2 (n=8)
Number of students who did not use Arclight on placement	2	1
Number of students who used Arclight 1–5 times.	1	7
Mean confidence in Direct Ophthalmoscopy (Likert scale 1-5)	3.00	3.63
Perception of whether access to Arclight increased opportunities to practice ophthalmic examination. (Likert scale 1-5)	1.00	2.00

Figure 2: Findings are limited by low post-placement survey responses. Results provide insight into low Arclight use on placement and minimal impact on ophthalmic examination opportunities across both cohorts.

Student feedback

Findings:

- **Pathology Identification:** Students successfully identified retinal hemorrhages, dry AMD, and corneal abrasions.
- **Practice:** Use occurred primarily in retina and eye casualty clinics, as well peer to peer use.

Barriers to Arclight use:

- **Assessment driven behaviour:** Students prioritised practice with traditional opthalmoscopes which align with current OSCEs and skills sign offs.
- **Lack of clinician knowledge on the Arclight Device:** leading to limited support for students using the device.
- **Lack of clinician supervision due to clinical pressures.**

Conclusion

- The Arclight device is an effective educational tool for initial skill aquisition in direct ophthalmoscopy and anterior eye surface examination.
- However, clinical use on placement was limited. Providing teaching and access to the Arclight device, does not ensure usage on placement if the tool is not integrated into formal assessment (OSCEs) or validated by clinicians.
- To bridge this gap, future interventions must shift focus toward clinician education on the Arclight device and institutional alignment to support the adoption of the Arclight in practice.

Acknowledgements

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