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Insertion of Incorrect Intraocular Lens during Cataract Surgery in the United Kingdom: Incidence Analysis of Never Events From 2011-2023 (rco2025.02600a7)

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Background

Cataract surgery with intraocular lens (IOL) insertion remains one of the most frequently performed surgical procedures in the UK, with more than half a million operations performed annually (1). Never events are defined as 'serious, largely preventable patient safety incidents that should not occur if the available preventative measures have been implemented'.

Incorrect intraocular lens (IOL) insertion during cataract surgery has been classified as a 'never event' since 2011. National guidelines promoting safe cataract surgery have been produced in recent years. This includes the adoption of the World Health Organisation (WHO) surgical checklist (2009) and a bespoke Royal College of Ophthalmology cataract checklist (2010). It remains unclear if timing of these interventions coincides with patterns of incidence of wrong IOL insertion and if these trends have changed with time.

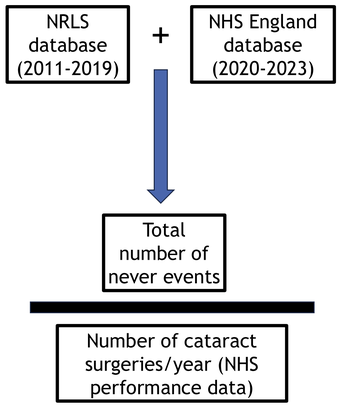
Aim

We aim to describe and analyse the incidence rates and trends of wrong IOL events across the United Kingdom from 2011-2023.

Methodology

Data regarding incorrect IOL insertions was extracted retrospectively from the NHS Improvement and Patient Safety Incidents submitted to the National Reporting and Learning System (NRLS) from 2011 to 2019. Number of cataract surgeries performed each year were derived from the publicly available NHS performance data.

Incidence rate of incorrect IOL never events for each financial year was calculated. Trend test was used to determine the statistical significance in the differences of incidence rates between the financial years. Incidence rate over the last 10 years were plotted against developments in ophthalmology related to never events.



Separate analysis was completed post COVID pandemic, due to a reduction in ophthalmic cases during the 2-year period. Further, recent data was extracted from the NHS England Never Events provisional and published database.

Wrong implant/prosthesis	**42**
Aortic graft	1
Cardiac stent	1
Cranial shunt	1
Fracture fixation plate	1
Hip	6
Intrauterine contraceptive device	4
Intrauterine contraceptive device intended for another patient	1
Knee	10
Lens	11

Figure 1: Example of data extracted from NHS Never Events published database
https://www.england.nhs.uk/wp-content/uploads/2023/05/provisional-publication-never-events-1-april-31-march-23.pdf

Results

Year	Number of phacos	Never event (wrong IOL)	% incidence
2011-12	339861	32	0.0094
2012-13	326707	29	0.0089
2013-14	360442	29	0.0080
2014-15	391131	18	0.0046
2015-16	393875	26	0.0066
2016-17	407319	21	0.0052
2017-18	398648	25	0.0063
2018-19	431504	8	0.0019
2019-20	451104	10	0.0022
2020-21	486000	10	0.0021
2021-22	409000	9	0.0022
2022-23	516,073	11	0.0021

Table 1: Summary table of wrong IOL never events per year in relation to the number of cataract surgery procedures

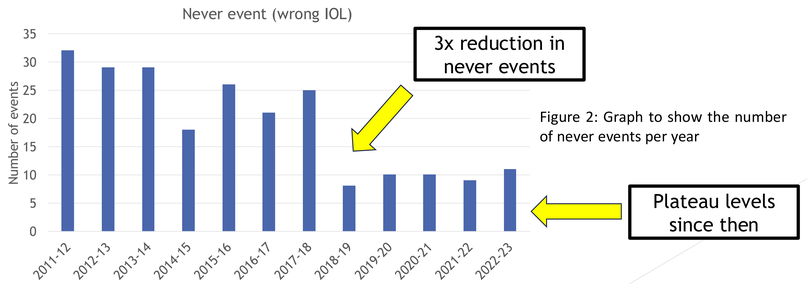


Figure 2: Graph to show the number of never events per year

Results

Incidence rate of wrong IOL never events within the NHS setting is <0.01% throughout between 2011-2023. There was a 3-fold reduction in the incidence rate from 2017-18 to 2018-19 (0.0063% to 0.0019%; p<0.001) and this was sustained in 2019-20 (0.0022%).

Incidence rates were highest in the first 3 years of recorded wrong IOL never events between 2011-14 (0.0094%; 0.0089%; 0.0080%). Percentage of never events remain to plateau at similar levels over the last 3 years, with an average of 0.0021% (10, 9, 11 per financial year) between 2020-2023. Further analysis suggested root and contributory causes which include incorrect biometry, wrong IOL selection, written/transcription errors.

Discussion

IOL selection and implantation is a complex, multi-level process. Common causes of incorrect IOL insertion include preoperative errors, IOL selection errors, intraoperative errors and breakdown of safety protocols. In a previous review (2003-2010), transcription of the IOL choice from biometry data itself was the leading source of error. This also included transcription errors from biometry to white boards, and operating lists (2).

Although the incidence of wrong IOL insertion has reduced with the initial widespread adoption of World Health Organisation (WHO) surgical safety checklist and the Royal College bespoke cataract checklist, these events continue to occur within hospital settings, and are possibly underreported.

The notable reduction in never events, specifically between 2018/2019 could be explained by further transparency and revision of the RCOphth adult cataract commissioning guidance and further investigation by the Health Services Safety Investigations Body (HSSIB) who launched an investigation in 2017/2018 into this issue.

Human factors are great contributors, and our study helps to identify and address these concerns. Furthermore, with the increased distribution of cataract services to the private sector, more transparency is needed regarding rates of never events, in order to enhance patient safety and optimise clinical outcomes.

Conclusion

Integration of WHO checklists into routine practice has significantly helped to reduce risk of never events. However, despite better understanding and rigorous protocols, we are seeing a plateau in rates over the last 3-4 years. Given the advances in the safety profile of phacoemulsification surgery, we should be aiming for zero events. This study has highlighted the need to further improvement in our practice and policies to further minimise avoidable human errors. Trusts and services should look deeply into these reports and we suggest integration of such data into the national ophthalmic database (NOD) annual reports.

References
(1) National Ophthalmology Database Audit for Cataract surgery The Royal College of Ophthalmologists. Available at: https://www.rcophth.ac.uk/news-views/view-the-findings-of-our-latest-national-ophthalmology-database-audit-for-cataract-surgery/#:~:text=Cataract%20surgery%20remains%20the%20most,Database%20(NOD)%20Audit%20now. (Accessed: 05 May 2025).
(2) Steeples, L.R. et al. (2016) Wrong intraocular lens events-what lessons have we learned? A review of incidents reported to the National Reporting and Learning System: 2010-2014 versus 2003-2010, Eye (London, England). Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4985682/ (Accessed: 05 May 2025).