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Finding Solutions to a Never-Ending Problem: Insights From a 10-Year Review of Surgical Never Events in NHS England

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Abstract

Introduction: Surgical never events (NEs) are preventable serious patient safety incidents. Despite the significant resources invested in the prevention of surgical NEs, hundreds of such events are reported annually. This paper explores trends in the types and frequency of surgical NEs reported by NHS England organisations over the preceding 10 years and suggests practical interventions for their prevention.

Materials and methods: This study analysed annual NEs data published by NHS England from April 2016 to March 2026 inclusive. Data relating to the frequency of total NEs, surgical NEs, different categories of surgical NEs, and hospital admission statistics were extracted into a Microsoft Excel® workbook (Microsoft Corporation, Redmond, WA, USA). Descriptive statistics and charts were produced using Microsoft Excel® to compare surgical NE counts and rates across the years under review, and the Mann-Kendall test was used to perform trend analysis.

Results: Surgical NEs accounted for approximately 80% of the 4,336 NEs reported over the past decade by NHS England organisations. The highest number of surgical NEs occurred during the year ending March 2019. Since the 2019 peak, there has been a statistically significant decline in the number of surgical NEs per hospital admission episode (Mann-Kendall $\tau = -0.86$; $p = 0.004$; Bonferroni-adjusted $p = 0.02$; rate of decline: −3.0%/year; 95% CI: −5.7% to −1.9%), although the corresponding fall in the overall incidence of surgical NEs was not statistically significant ($\tau = -0.21$; Bonferroni-adjusted $p = 1.000$).

Conclusion: There has been a downward trend in the number of surgical NEs per hospital admission episode across NHS England organisations since the COVID-19 pandemic. This may be due, in part, to the widespread adoption of surgical safety checklists since the year 2021. To further minimise the occurrence of surgical NEs, it is important to focus on addressing specific incidents, such as wrong site and wrong patient surgery, retained surgical and vaginal swabs, and wrong orthopaedic implants, which account for a disproportionate number of surgical NEs.

Categories: Urology, Obstetrics/Gynecology, Orthopedics
Keywords: general surgery, never event, retained foreign body, surgical safety, wrong implant, wrong site surgery

Introduction

Never events (NEs) are serious patient safety incidents which are preventable, provided existing national barriers and safety systems are correctly implemented locally [1,2]. These incidents, which reflect systemic deficiencies rather than individual failings, may cause serious harm to patients [1]. Although NEs occur in a wide variety of clinical settings, surgical NEs, defined in this study as NEs occurring in any clinical environment where invasive procedures are performed, are particularly important because they may result in significant morbidity. In addition, they sometimes require invasive interventions to correct or reverse [3,4]. Furthermore, surgical NEs account for a significant proportion of claims made against NHS organisations, costing the taxpayer millions of pounds annually in legal expenses and financial settlements [5].

Since the NEs framework was introduced by NHS England in 2009, the list of NEs has been revised and amended several times to ensure that it captures the incidents most relevant to the NHS and patient safety [1,6]. The most recent update to the NEs list in February 2018 identifies three major categories of surgical NEs: wrong site surgery or surgery performed on the wrong patient, wrong implant or prosthesis, and retained foreign object post-procedure [1]. However, responses from the 2024 Never Events framework consultation suggested that the current framework is ineffective and unfit for purpose and requires an overhaul [7]. Since the NHS invests significant resources in investigating and reporting NEs [1,7], it is important that these efforts directly lead to interventions that prevent recurrences, rather than merely fulfil statutory obligations.

This study analyses trends in the incidence and types of surgical NEs reported by NHS England organisations over the preceding 10 years. It aims to improve awareness and understanding of surgical NEs. Furthermore, it proffers practical solutions that, if implemented, could drastically reduce the medicolegal and financial burden of these preventable incidents on the health system. Finally, it aims to stimulate interest in further research into surgical NEs.

Materials And Methods

This study primarily analysed annual NEs data reported by NHS England organisations between 1st April 2016 and 31st March 2026, available on the NHS England website [8]. Each publication covers the interval between April of the preceding year and March of the index year and includes all NEs reported during the period, broken down into different categories. In addition, each publication reports the frequency of NEs by calendar month. The three most recent publications, which covered the period from April 2023 to March 2026 inclusive, reported provisional NEs data. As local NHS organisations complete investigations into these provisional NEs, the final number of NEs may vary slightly. However, once a NE has been correctly identified and reported, it cannot be downgraded, even if it no longer meets future criteria [1]. Provisional data used in this study were correct as of 31st July 2026. Data relating to the frequency and types of all NEs during the period under review were extracted. NEs reported under the categories of "wrong site surgery", "retained foreign object post-procedure", and "wrong implant and prosthesis" were analysed as surgical NEs, while all other NEs were analysed as non-surgical NEs. Similarly, annual hospital admission statistics across NHS England organisations was obtained from the NHS England website to compare variations in the frequency of surgical NEs with clinical activity over the period under review [9]. Data for each year under review were exported to a Microsoft Excel® file (Microsoft Corporation, Redmond, WA, USA). Descriptive statistics and charts were produced with Microsoft Excel® (version 2608, August 2026) to compare NEs and hospital admission data across the years under review. The Mann-Kendall trend test, downloaded as a Microsoft Excel® add-in, was used to analyse trends in the frequency of NEs across the 10 years under review, with p-values of <0.05 considered statistically significant. To account for multiple testing across the five trend analyses performed, a Bonferroni correction was applied, with adjusted p-values calculated as the raw p-value multiplied by the number of tests ($m = 5$; capped at 1.0). The magnitude of trend was estimated using Sen's slope and expressed as a percentage of the year ending March 2019 rate.

There was no formal requirement for ethical approval, since the study used anonymised, publicly available NHS data.

Results

Gross NEs data

The total number of NEs during the period under review was 4,336. The 12-month period from April 2018 to March 2019 witnessed the highest number of NEs with 538 incidents, while the lowest number of NEs occurred during the year ending March 2024 with 370 incidents (Figure *1*). October had the highest burden of NEs, with a mean of 42 incidents recorded. In contrast, February and December had the lowest mean of NEs, with 32 incidents each (Figure *2*).

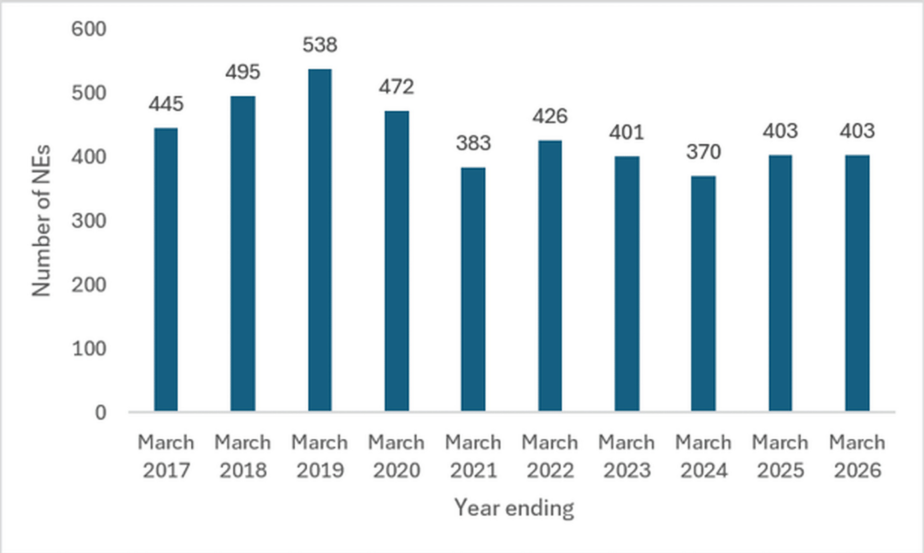


FIGURE 1: The annual frequency of NEs during the period under review.

NEs: never events

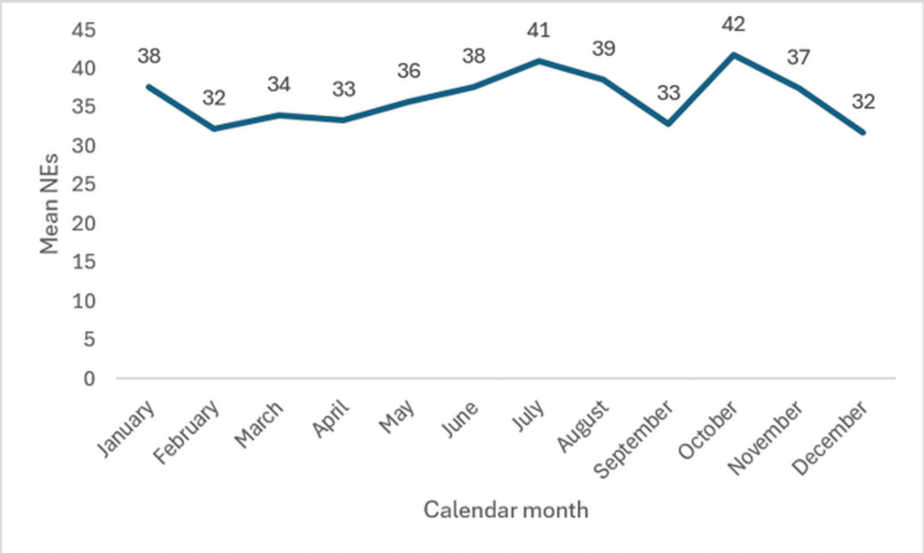


FIGURE 2: Mean number of NEs per calendar month during the period under review.

NEs: never events

Surgical NEs data

There were 3,441 surgical NEs during the period under review. These accounted for 79.4% of all NEs. The highest number of surgical NEs occurred during the period between April 2018 and March 2019, with 413 events reported (Figure *3a*). In contrast, the lowest number of surgical NEs occurred between April 2020 and March 2021 when 270 events were recorded. Non-surgical NEs peaked at 125 during the year ending March 2019, falling to 62 in the year ending March 2025 (Figure *3b*).

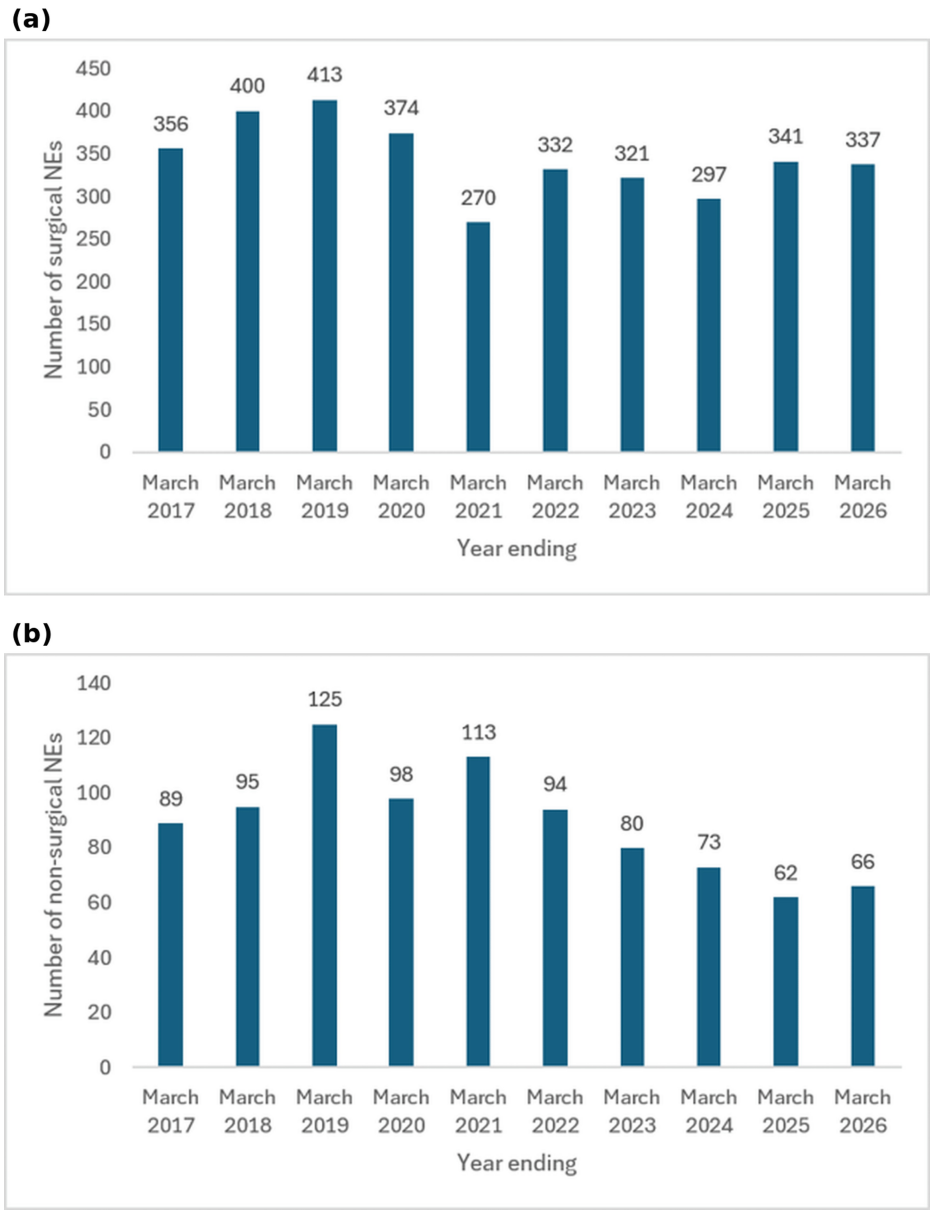


FIGURE 3: The number of (a) surgical NEs and (b) non-surgical NEs recorded during the period under review.

NEs: never events

During the early part of the period under review, the ratio of surgical NEs to total NEs fell from 0.80 to 0.70. However, this ratio has slowly climbed up since the year ending March 2021, peaking at 0.85 during the year ending March 2025 (Figure 4).

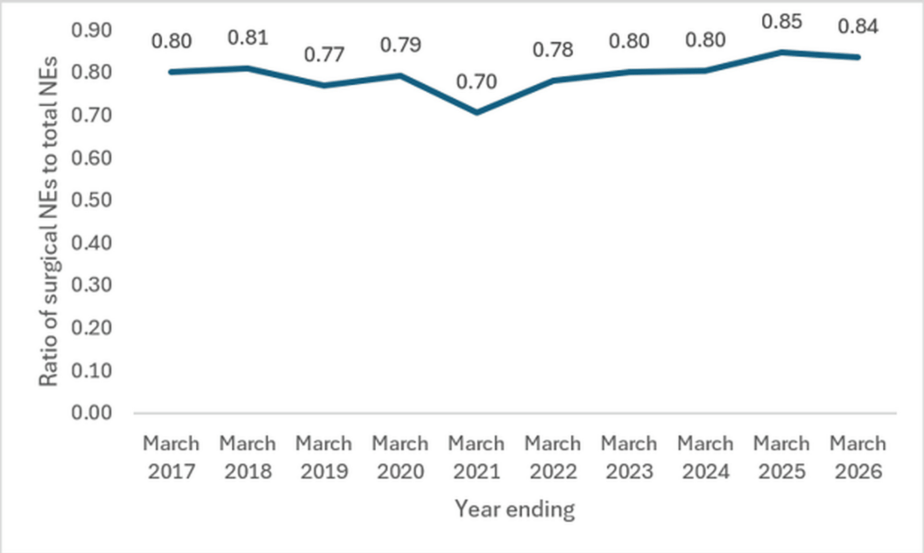


FIGURE 4: The ratio of surgical NEs to total NEs during the 10-year period from 2016 to 2026.

NEs: never events

Ratio of surgical NEs to hospital admission episodes

To correct for the impact of variations in the number of procedures performed on the frequency of surgical NEs, we have used the total number of finished admission episodes (FAEs) as a surrogate for surgical activity during the period under review. Each FAE accounts for a single hospital admission, regardless of the clinical specialty. As illustrated in Figure *5a*, the total number of FAEs rose steadily between the year ending March 2017 and the year ending March 2020. It subsequently fell to its lowest value during the year ending March 2021, a period which captures much of the COVID-19 pandemic, before steadily rising to its peak during the years ending March 2025 and March 2026. The number of surgical NEs per 100,000 FAEs gradually declined from a peak of 2.41 in the years ending March 2018 and March 2019 to 1.69 in the year ending March 2024 (Figure *5b*), with small upswings in the years ending March 2025 and March 2026.

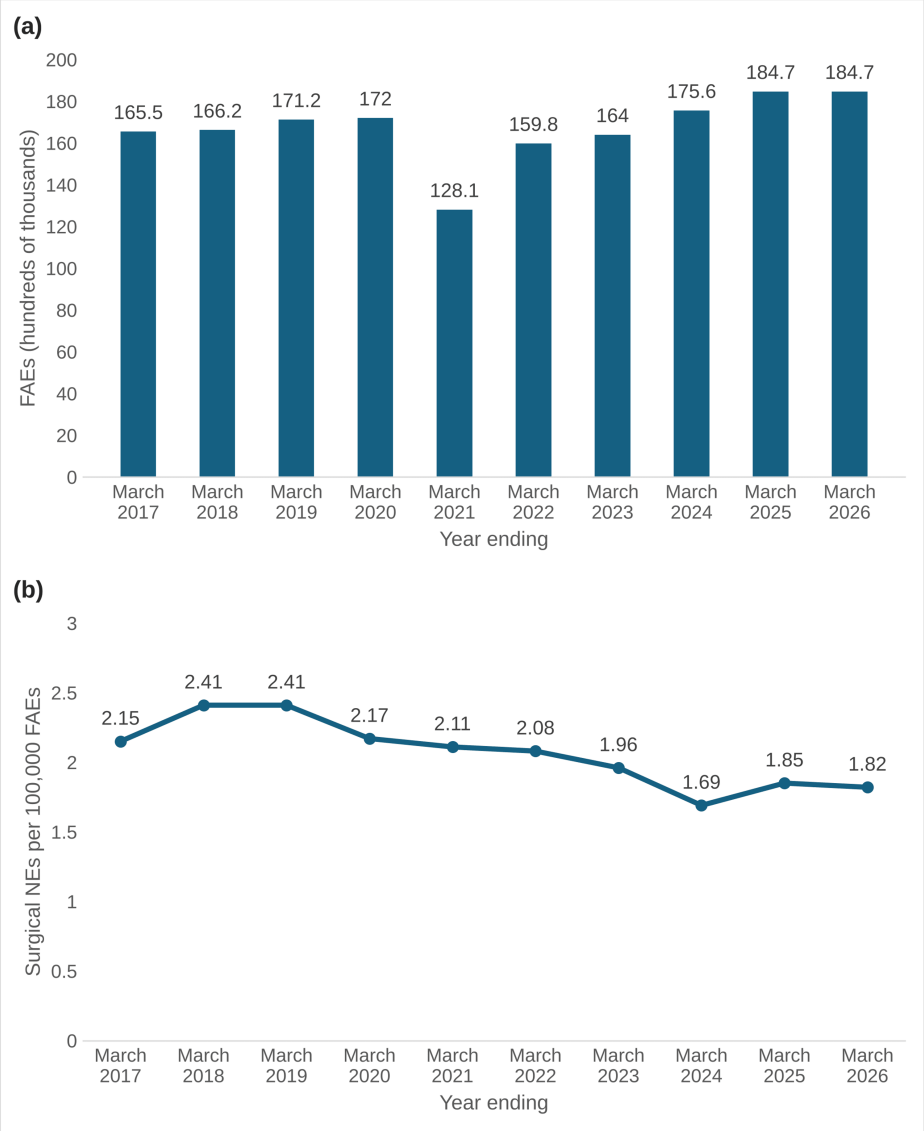


FIGURE 5: (a) FAEs across NHS England organisations between the year ending March 2017 and the year ending March 2026, correct to one decimal place. (b) Surgical NEs per 100,000 FAEs between the year ending March 2017 and the year ending March 2026, correct to two decimal places.

NEs: never events; FAEs: finished admission episodes

Overall, while surgical NE counts have generally declined since the 2019 peak, the trend was not statistically significant (Mann-Kendall τ = -0.21; Bonferroni-adjusted p = 1.000). However, the FAE-normalised surgical NE rate showed a statistically significant decline (τ = −0.86; p = 0.004; Bonferroni-adjusted p = 0.02) since the 2019 peak, which amounts to a fall of 0.073 per 100,000 FAEs per year (95% CI: -0.138 to -0.047 per 100,000 FAEs per year). This represents a drop in the FAE-normalised surgical NE rate of 3% per year (95% CI: -5.7% to -1.9%) relative to 2019.

Breakdown of surgical NEs

As illustrated in Figure 6, over half of the 3,441 surgical NEs reported between April 2016 and March 2026 involved wrong site or wrong patient surgery. In comparison, wrong implant insertion accounted for approximately one in seven surgical NEs. Interestingly, as shown in Figure 7, the proportion of surgical NEs represented by each of the three categories was mostly stable over the past decade. Mann-Kendall trend tests confirmed no statistically significant change in the proportional contribution of any category over the study period (wrong site or wrong patient surgery: τ = −0.07 (p = 0.86); retained foreign object: τ = +0.16 (p = 0.59); wrong implant: τ = −0.20 (p = 0.47)).

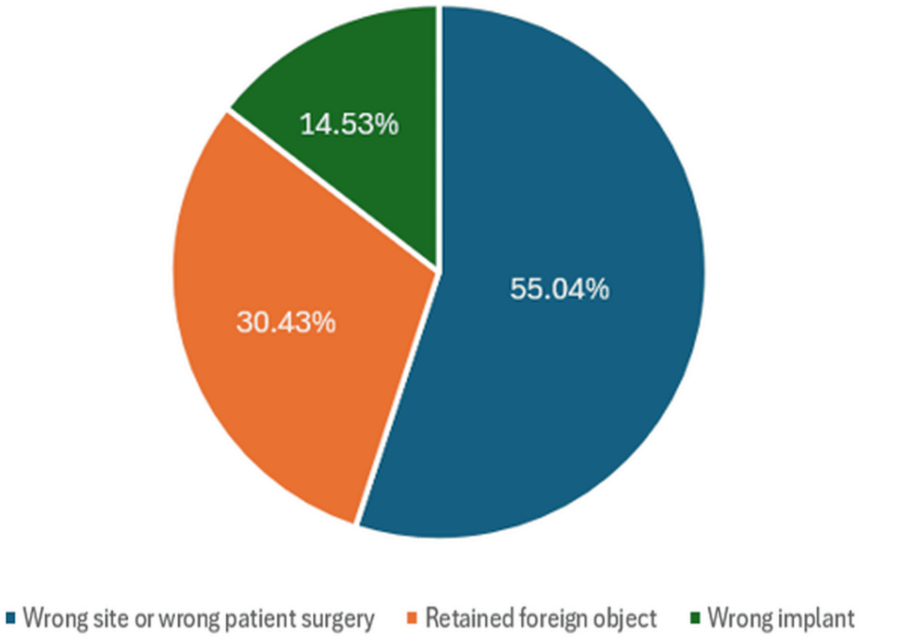


FIGURE 6: Proportion of surgical NEs between April 2016 and March 2026 by category.

NEs: never events

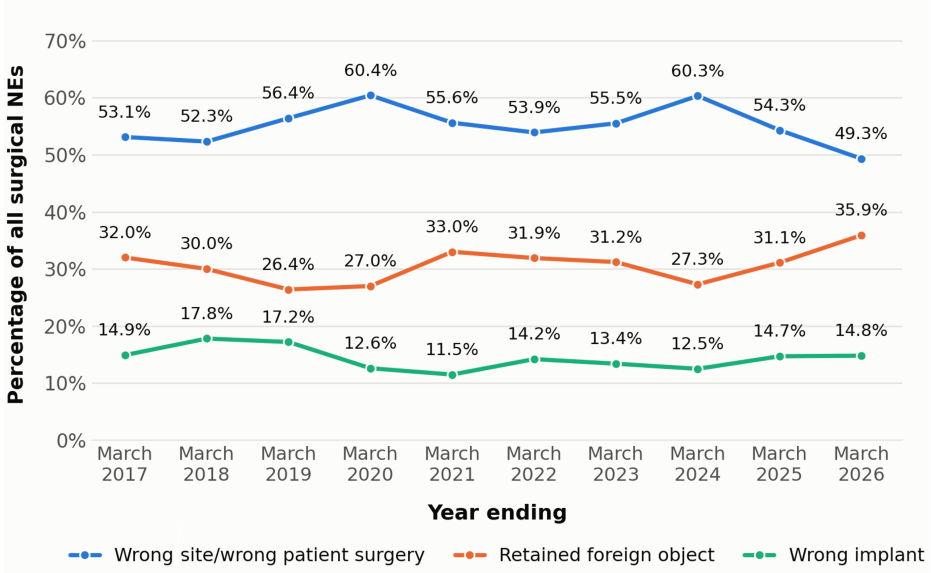


FIGURE 7: Trends in the proportion of surgical events by category over the previous decade.

NEs: never events

Sub-analyses of selected categories of surgical NEs

Over the past decade, vaginal swabs accounted for more than a quarter of all cases of retained foreign objects, equivalent to 8.5% of surgical NEs and 6.7% of all NEs (Figure *8*). Taken together, retained surgical, vaginal, and throat swabs/packs amounted to 14.5% of surgical NEs. There were 247 reported incidents of partial or complete retention of a guidewire.

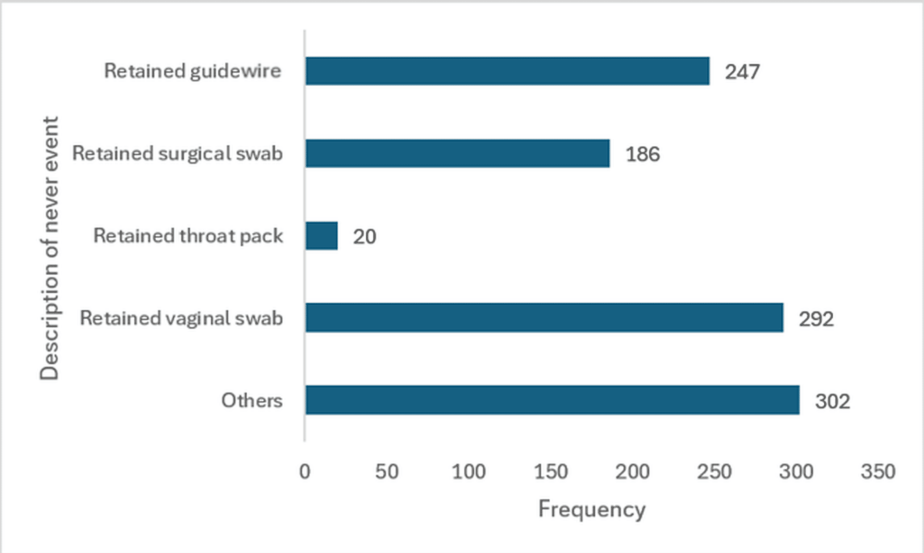


FIGURE 8: The commonest examples of retained foreign object post-procedure between April 2016 and March 2026.

While intraocular lenses constituted a quarter of the 500 total incidents of wrongly inserted implants, orthopaedic implants cumulatively accounted for 51.2% of all implant-related surgical NEs (see Figure 9), with knee implants taking the largest share in this sub-category. Ureteric stents and contraceptive implants were less commonly implicated in incidents of wrong implant insertion.

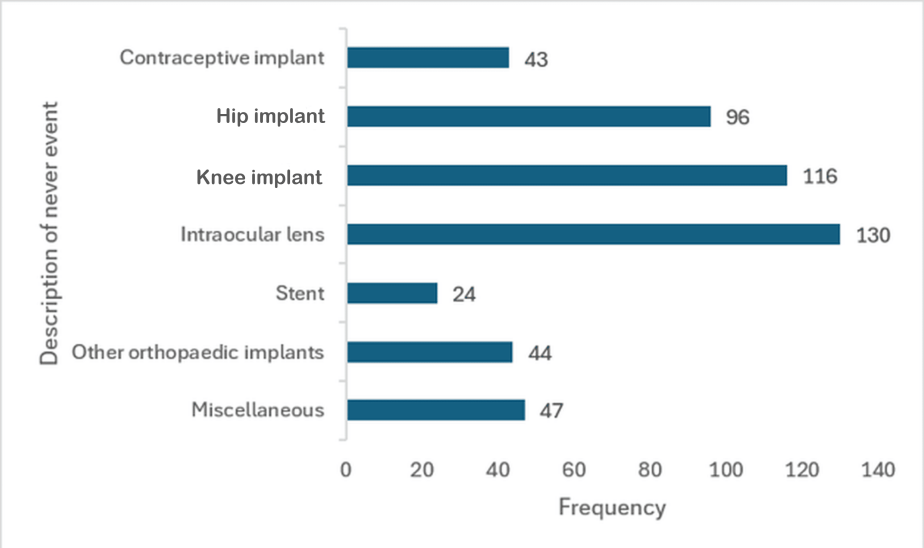


FIGURE 9: Breakdown of implant-associated surgical NEs over the 10-year period from April 2016 to March 2026. Orthopaedic implants, including knee and hip implants, accounted for a significant proportion of events in this sub-category.

NEs: never events

A summary of the NEs and FAE data used in this study is included in Appendices A and B.

Discussion

Surgical NEs accounted for approximately 80% of all NEs reported across NHS England organisations over the past decade. This ratio has slowly crept up since the year ending March 2021, apparently due to a comparatively greater decline in the incidence of non-surgical NEs. It remains to be seen whether this trend

will continue. Contrary to expectation, the revision of the NEs list in February 2018 did not lead to sustained changes in the incidence of both surgical and non-surgical NEs.

The fact that surgical NEs continue to occur despite the significant resources and attention devoted to preventing them suggests that, although they are preventable, they cannot be completely eradicated. Sporadic occurrences of surgical NEs in an organisation may not necessarily indicate sub-standard care [10]. Therefore, the terminology "never event" is a misnomer [2,11]. It often triggers negative emotions among involved members of staff, and it may hinder open communication and experiential learning [7]. We recommend replacing this problematic terminology with "serious reportable events" as recommended by the US-based Association of Health Care Journalists [12] or "preventable serious events", which is our preferred label as it emphasises both the preventable and serious nature of such incidents.

The year ending March 2019 witnessed the highest number of surgical NEs reported over the past decade. Since this peak, there has been a downward trend in both the total number of surgical NEs and the number of surgical NEs per 100,000 FAEs, although only the decline in the FAE-normalised count was statistically significant. This decline in surgical NEs occurred despite an increase in the number of surgical procedures completed by NHS England organisations following the COVID-19 pandemic [13], driven in part by the creation of elective surgical hubs [14]. Nevertheless, the least number of surgical NEs in the past decade occurred during the COVID-19 peak in 2020, during which elective operating was largely suspended. Although these two observations may at first appear irreconcilable, it is plausible that, while surgical NEs typically increase with the number of procedures performed, the relationship may be non-linear and saturable, such that, beyond the saturation level, the frequency of surgical NEs may decrease as more operations are performed. This may reflect increased competence among surgeons, scrub nurses, and theatre practitioners at identifying and preventing potential NEs, as well as improvements in pathways designed to minimise NEs. Therefore, one potential solution to minimising NEs is to optimise operating and procedural numbers, ideally by using the same team for the same specialty in the same theatre, to promote institutional efficiency. Obviously, this expansion in operating numbers must be accompanied by a commensurate expansion in surgical and operating theatre staff to minimise cognitive overload and fatigue, which are known to increase the likelihood of NEs [15].

More than half of the surgical NEs recorded during the previous decade involved wrong patient or wrong site surgery. The WHO surgical safety checklist helps to prevent these errors by confirming the identity of the patient and the surgical site prior to the commencement of a procedure [16]. Unfortunately, while the checklist was adopted in operating theatres across the UK in 2009 [17], it was not adapted for use in other areas, such as endoscopy and maternity suites, where invasive procedures are routinely performed, until much later. The European Society of Gastrointestinal Endoscopy and the European Society of Gastroenterology and Endoscopy Nurses and Associates released guidance for the adoption of a modified safety checklist for gastrointestinal endoscopy procedures in 2021 [18], while the Second National Safety Standards for Invasive Procedures (NatSSIPS 2) recommended eight sequential steps, which mirror the WHO safety checklist, for all invasive procedures performed in the UK in 2023 [19]. These recommendations may have contributed, at least in part, to the fall in the number of surgical NEs per 100,000 FAEs from 2021 onward. The strict enforcement of safety checklists across all clinical environments where invasive procedures are performed in every NHS trust, including clinics, endoscopy suites, and interventional radiology units, is possibly the single most impactful action that can be taken to minimise surgical NEs. However, regular audits are required to monitor the correct use of safety checklists and maintain their efficacy in preventing surgical NEs [20].

Nearly half of all cases of retained foreign objects post-procedure over the last decade involved surgical, vaginal, or throat swabs and packs. Swabs and packs are commonly used in surgery to absorb body fluids and shield vital organs away from the operative field in hollow cavities. Generally, they are removed prior to wound closure, although vaginal swabs may be left post-operatively to tamponade vessels and reduce bleeding. Strategies to prevent the inadvertent retention of surgical swabs include meticulously counting and inspecting swabs before, during, and after wound closure, using swabs with radio-opaque strips to aid detection by plain X-ray and CT scan, and incorporating radiofrequency tags to facilitate easy localisation of swabs [21,22]. The use of swabs with long tips anchored to a single pivot may also prevent the "loss" of individual swabs [23]. Importantly, throat swabs used by the anaesthetist must be incorporated into the total "surgical" count to ensure that they are accounted for at the end of the procedure. Finally, if the surgical plan requires a patient to leave the procedure room with one or more swabs in situ, the operative note should indicate whose responsibility it is to remove the swab. We also recommend that such a patient should be provided with a custom-made wristband which indicates the number and types of swabs, until the swabs are removed.

While orthopaedic implants cumulatively constituted the majority of wrong implants implicated in surgical NEs, intraocular lenses were the single commonest wrong implants involved in NEs during the period under review. The National Institute for Health and Care Excellence (NICE) recommends the use of two "stop moments" to check and verify the type, size, laterality, sterility, and expiry date of every orthopaedic implant, firstly prior to insertion and subsequently prior to wound closure [24]. The use of computer software to label and screen orthopaedic implants for compatibility complements human checks and has been shown to further reduce implant errors [25]. Recommendations to minimise the selection of wrong

intraocular lenses for patients include the use of a three-stage approach: confirmation of patient identity, eye laterality, and biometry data, prior to the selection and implantation of each intraocular lens, avoiding lens selection intra-operatively, and ensuring that only the selected intraocular lens is taken into the operating theatre with the patient [26].

An important limitation of the study is that it used FAEs as a surrogate for the total number of surgical procedures performed across NHS England organisations. This was done because there is no clear definition of what constitutes a "surgical procedure" in the NHS. Many invasive interventions, such as colonoscopies and angiographies, are performed by medical specialists, and an increasing number of surgical interventions, such as cystoscopies, are performed in outpatient clinics and may not be captured by operating theatre data. Therefore, getting an accurate and consistent count of the total number of surgical procedures performed across NHS England organisations annually over a 10-year period is impractical.

Secondly, NHS England began the transition from the National Reporting and Learning System (NRLS) for identifying, reporting, and processing NEs to the Learn from Patient Safety Events (LFPSE) system in 2021 [27]. This migration to a new system could have independently influenced the NEs count, especially around the transition period.

Finally, it is important to note that the NEs data for the period between April 2023 and March 2026 are provisional figures. As NHS England organisations complete investigations into serious clinical incidents, it is possible that additional surgical NEs will be identified. Therefore, the size of the downward trend in the FAE-normalised count of surgical NEs in recent years may well be diluted. However, according to our calculations, it will take an undercount of approximately 14% or more across these three years to overturn the nominal statistical significance of the FAE-normalised downward trend in surgical NEs.

Conclusions

Surgical NEs are a significant problem in the NHS. Part of the problem lies with the terminology, which triggers negative emotions among involved members of staff and hinders open communication. Nevertheless, the FAE-normalised count of surgical NEs across NHS England organisations has fallen since the COVID-19 pandemic. However, the upswing in the raw number of surgical NEs in the two most recent years is worthy of observation. Wrong patient and/or wrong site surgery, which remains the commonest category of surgical NE, can be rolled back by the universal adoption of safety checklists. Similarly, incidents such as retained surgical swabs and wrong orthopaedic/intraocular lens implants, which account for a disproportionate number of surgical NEs, can be prevented using simple interventions. Focusing on this low-hanging fruit will likely curtail the burden of surgical NEs on the patients and the wider health system.

Appendices

Appendix A

Year ending March	Total NEs	Surgical NEs	Non-surgical NEs	Surgical-to-total ratio	FAE (millions)	Surgical NEs per 100,000 FAE
2017	445	356	89	0.80	16.55	2.15
2018	495	400	95	0.81	16.62	2.41
2019	538	413	125	0.77	17.12	2.41
2020	472	374	98	0.79	17.20	2.17
2021	383	270	113	0.70	12.81	2.11
2022	426	332	94	0.78	15.98	2.08
2023	401	321	80	0.80	16.40	1.96
2024	370	297	73	0.80	17.56	1.69
2025	403	341	62	0.85	18.47	1.85
2026	403	337	66	0.84	18.47	1.82
Total	4,336	3,441	895	0.79	-	-

TABLE 1: Summary of annual NEs, surgical NEs, and FAEs across NHS England organisations, from year ending March 2017 to year ending March 2026. The total row's surgical-to-total ratio is the aggregate value (3,441/4,336), not a mean of the yearly ratios.

NEs: never events; FAEs: finished admission episodes

Appendix B

Year ending	Wrong site/wrong patient surgery	Retained foreign object	Wrong implant	Total
March 2017	189	114	53	356
March 2018	209	120	71	400
March 2019	233	109	71	413
March 2020	226	101	47	374
March 2021	150	89	31	270
March 2022	179	106	47	332
March 2023	178	100	43	321
March 2024	179	81	37	297
March 2025	185	106	50	341
March 2026	166	121	50	337
Total	1,894	1,047	500	3,441

TABLE 2: Breakdown of surgical NEs across NHS England organisations by category, from year ending March 2017 to year ending March 2026.

NEs: never events

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Olakunle G. Akanji, Kaviraasen Mootoosamy

Acquisition, analysis, or interpretation of data: Olakunle G. Akanji

Drafting of the manuscript: Olakunle G. Akanji

Critical review of the manuscript for important intellectual content: Olakunle G. Akanji, Kaviraasen Mootoosamy

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. **Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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