

Audit

Citation: Danushka PGN, Jayasinghe R, Osudhihansi M, et al, 2025. Enhancing Neurosurgical Practice through Adherence to Operative Note Guidelines: An Audit. Sri Lanka Journal of Medicine, pp. 43-50
DOI: <https://doi.org/10.4038/sljm.v34i3.570>

Enhancing Neurosurgical Practice through Adherence to Operative Note Guidelines: An Audit

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ABSTRACT

Introduction: Comprehensive documentation is a crucial element of surgical procedures. This study aims to evaluate the quality of operative note-writing within a neurosurgical unit in Sri Lanka, ensuring adherence to the Royal College of Surgeons of England guidelines. **Methods:** Data was extracted by an audit at the neurosurgical unit of Sri Lanka, pre and post-intervention where an educational program on documentation was conducted and standardised operative note template was introduced. Data was analysed by SPSS software and assessed by Wilcoxon Signed Rank Test. **Results:** Initially the signature (1%), prosthesis serial number (1%), estimated blood loss (3%), complications (5%), reasons for extra procedures (11.9%), and name of anaesthetist (19.8%) was minimally documented which significantly improved post-intervention. Post-operative antibiotics and deep vein thrombosis prophylaxis use was also significantly improved similarly ($p < 0.05$). **Conclusion:** Educational intervention significantly improved the guideline compliance for operative notes which is recommended to be explored at multiple settings with larger samples.

Keywords: Neurosurgery standards, documentations, proper operative notes

INTRODUCTION

Operation notes documentation includes comprehensive information about surgical procedures. It typically contains intra and post operative details (1). The General Medical Council also advises surgeons to maintain records that are accurate, thorough, and easy to read (2). Inadequate documentation can adversely affect postoperative care at immediate, pre discharge and long-term patient care (3). The Royal College of Surgeons of England (RCS) has established comprehensive guidelines for writing operative notes, encompassing essential components

which are regarded as the gold standard guidelines for operative notes(4).

Antibiotic prophylaxis and deep vein thrombosis (DVT) prophylaxis are crucial to prevent surgical site infections and thromboembolic complications, respectively (5). However, evidence suggests that adherence to established guidelines for these interventions can be suboptimal, potentially compromising patient outcomes (6, 7). Therefore, RCS England has included those two components as a mandatory part of postoperative instructions. The literature



from various countries has reported inconsistencies in the quality and completeness of documentation (8-10). Reasons for non-compliance included the absence of formal teaching, incomplete note format, and lack of time (11). Studies have shown that comprehensive and accurate documentation is associated with enhanced patient safety, improved communication among healthcare workers, and better medicolegal protection (12, 13).

This audit aimed to assess the quality of operative note writing in a tertiary care neurosurgical unit in Sri Lanka through the lens of the RCS England guidelines. This audit intended to provide valuable insights for improving the quality of operative notes and enhancing the overall standard by addressing gaps in existing research providing practical guidance tailored to the Sri Lankan context.

METHODOLOGY

A retrospective audit was conducted in the neurosurgical wards of the National Hospital Sri Lanka for three months duration. A total of 101 patients were included in the initial study. An electronic data extraction sheet was used to obtain data from patient bed head tickets (BHTs). This contained basic demographic data and components of the operative note format according to the RCS England guidelines, including the correct prescription of prophylactic antibiotics and DVT prophylaxis. All data were anonymised and securely kept with access limited to the principal investigator and co-investigators.

After the initial audit, the principal investigator conducted a presentation during the monthly clinical meeting with the medical staff in the neurosurgical units, including all the consultants. A standardised template for writing an operative note was introduced and made freely accessible in the theatres.

Three months post-intervention, a second audit was conducted using the same methodology including 91 patients and same topics were assessed. The data was analysed using SPSS

software. Wilcoxon Signed Rank Test was used to assess the statistical significance.

Ethics clearance for the research was obtained from the Ethics Review Committee of the National Hospital of Sri Lanka (NHSL), and approval was obtained from the director of NHSL and the consultant in charge of the relevant unit.

RESULTS

The mean age in the pre-intervention group was 47.1 years while it was 51.5 years in the post-intervention group. In both, majority were males comprising 60.4% of each group. Before the intervention, the distribution of emergency, urgent, scheduled, and elective surgeries was approximately equal (28.7%, 19.8%, 24.8% and 26.7% respectively). However, after the intervention, elective procedures amount was drastically increased into a majority (51.6%) while emergency, urgent and scheduled surgeries were reduced to 23.1%, 8.8% and 16.5%, respectively.

Most of the operative notes were written by medical officers in both the pre-intervention (60.4%) and post-intervention (48.4%) groups. Pre-intervention 30.7% were written by senior registrars while 8.9% was written by registrars who increased post-intervention to 40.7% and 11% respectively. Before the intervention, the writer of the operative notes was involved in the surgery 84.2% (n=85) of the time which increased to 92.3% (n=84) after the intervention; yet was not statistically significant ($p=0.074$).

Table 1 describes the compliance to each component of the operative notes before and after the intervention. Prior to the intervention, the checklist items least frequently mentioned were signature (1%), prosthesis serial number if applicable (1%), estimated blood loss (3%), complications (5%), reasons for extra procedures if applicable (11.9%), and name of anaesthetist (19.8%). Post-intervention, all of them showed over 60% improvement: signature (92.3%), prosthesis serial number (93.4%), estimated blood loss (70.3%), complications (96.7%), reasons for extra procedures if applicable (88.2%), and name of anaesthetist (83.5%). Date was present in 75.2% but time was present only in 29.7% before

the intervention and it significantly improved to 96.7% and 91.2% respectively after the intervention. The presence of operative diagnosis, operative findings, and extra procedures performed, details of tissues removed, added or altered, details of any prosthesis used if applicable and detailed postoperative care instruction also

improved after the intervention. After the intervention, adherence to all components in writing operative notes significantly improved ($p < 0.05$) Wilcoxon Signed Rank Test (Z) was used to assess the statistical significance.

Table 1: Distribution of compliance with each component of operative notes pre and post-intervention

Variable	Pre intervention		Post intervention		Test statistic
	Yes (%)	No (%)	Yes (%)	No (%)	
Operative note present	99 (98.0)	2 (2.0)	90 (98.9)	1 (1.1)	Z= -9.120 P=1.000
Date	76 (75.2)	25 (24.8)	88 (96.7)	3 (3.3)	Z= -5.927 P <0.001
Time	30 (29.7)	71 (70.3)	83 (91.2)	8 (8.8)	Z= -0.967 P <0.001
Names of surgeon and assistant	96 (95.0)	5 (5.0)	91 (100)	-	Z= -8.777 P=0.046
Name of anesthetist	20 (19.8)	81 (80.2)	76 (83.5)	15 (16.5)	Z= -0.399 P <0.001
Operative procedure carried out	92 (91.1)	9 (8.9)	91 (100)	-	Z= -8.200 P=0.003
Incision	63 (62.4)	38 (37.6)	91 (100)	-	Z= -4.666 P <0.001
Operative Diagnosis	45 (44.5)	56 (55.4)	86 (94.5)	5 (5.5)	Z= -2.518 P <0.001
Operative findings	57 (56.4)	44 (43.6)	84 (92.3)	7 (7.7)	Z= -3.536

					P <0.001
Complications	5 (5.0)	96 (95.0)	88 (96.7)	3 (3.3)	Z= -0.590
					P <0.001
Extra procedures if performed	31 (38.8)	49 (61.2)	61 (80.3)	15 (19.7)	Z= -1.655
					P <0.001
Reasons for extra procedures if applicable	12 (15.0)	68 (85.0)	67 (88.2)	9 (11.8)	Z= -1.143
					P <0.001
Detail of tissues removed, added or altered if applicable	72 (71.3)	29 (28.7)	84 (92.3)	7 (7.7)	Z= -5.174
					P <0.001
Details of any prosthesis used if applicable	13 (28.9)	32 (71.1)	86(94.5)	5 (5.5)	Z= -4.971
					P <0.001
Serial number of the prosthesis if applicable	1 (2.2)	44 (97.8)	85 (93.4)	6 (6.6)	Z= -3.712
					P <0.001
Details of closure technique	40 (39.6)	61 (60.4)	90 (98.9)	1 (1.1)	Z= -2.360
					P <0.001
Estimated blood loss	3 (3.0)	98 (97.0)	64 (70.3)	27 (29.7)	Z= -2.671
					P <0.001
Detailed post op care instructions	37 (36.6)	64 (63.4)	90 (98.9)	1 (1.1)	Z= -2.095
					P <0.001
Signature	1 (1.0)	100 (99.0)	84 (92.3)	7 (7.7)	Z= -1.180
					P <0.001

Table 2 describes the presence of antibiotic prophylaxis and DVT prophylaxis in operative notes. Before the intervention, antibiotic prophylaxis was mentioned correctly only in 23.8% and which has improved up to 100% which was

statistically significant ($p < 0.05$). Before the intervention, DVT prophylaxis was not mentioned correctly in any operative note and after the intervention 69.2% mentioned it correctly which is also a statistically significant finding ($p < 0.05$).

Table 2: Distribution of compliance with the components of antibiotic prophylaxis and DVT prophylaxis in operative notes before and after the educational intervention

Variable		Pre-intervention		Post-intervention		P
		Frequency	Percentage	Frequency	Percentage	value
Antibiotic prophylaxis	Mentioned correctly	24	23.8	91	100	Z= -1.093 P <0.001
	Mentioned incorrectly	50	49.5	-	-	
	Not mentioned	27	26.7	-	-	
	Not Applicable	-	-	-	-	
DVT Prophylaxis	Mentioned Correctly	-	-	63	69.2	Z= -7.679 P <0.001
	Mentioned incorrectly	6	5.9	18	19.78	
	Not mentioned	94	93.1	10	10.99	
	Not Applicable	1	1.0	-	-	

DISCUSSION

Accurate and detailed record-keeping is critical in surgical practice. It would not only enhance patient safety, improve post-surgical outcomes but also will serve as a fundamental component of patient care, education, and research.

Pre-Intervention Study Findings

In the pre-intervention audit, the name of the surgeon and assistant was mentioned in 95% of operative notes. This aligns with international studies, which reported surgeon documentation rates between 84.8% and 100%, and assistant

documentation rates generally above 75% (8, 9, 11).

The name of the anesthetist was included in only 19.8% of operative notes, which is markedly lower than the 41–46% reported in the literature (9, 14), a figure that is itself considered inadequate. Notably, an audit in Turkey revealed no documentation of the anesthesiologist's name in any of the operative notes (15). In contrast, studies from the UK and Pakistan demonstrated higher compliance rates of 83% and 62–78%, respectively (8, 10, 11, 16), although these rates still fall short compared to the consistent documentation of surgeons' and assistants' names. This significant discrepancy emphasises the need to place greater emphasis on recording the anesthetist's name, given their critical role in optimising pre and postoperative patient outcomes.

In our study, the date was recorded in 75.2% of the notes, while the time of the operation was documented in only 29.7%. Comparable studies reported higher compliance for date documentation (86–100%) but similarly low rates for time documentation (0–62%) (8–11, 15, 16).

Documentation of intraoperative complications and estimated blood loss was particularly poor, at 5% and 3%, respectively. These rates are lower than those in the literature, where documentation of complications ranged from 10–21.5% and documentation of blood loss ranged from 10–50% (8, 10, 16). The omission of such critical information can hinder postoperative management and communication among care teams.

Most neurosurgical patients receive post-operative ICU care. Antibiotic prophylaxis was mentioned in only 23.8% of operative notes, and DVT prophylaxis was not mentioned at all. This is consistent with findings from the UK and Pakistan, where antibiotic prophylaxis documentation was 27% and DVT prophylaxis was often omitted (10, 16). Given the importance of these interventions in postoperative care, their omission highlights an area for significant improvements.

Recent evidence reported mentioning of operative findings (70.8%-100%) (8, 14, 16-18), operative intervention (98%-100%) (9, 10, 14, 17, 18), and incision (97%- 100%) (14, 16, 17) in the majority of operative notes, which were similar to our study findings. In contrast to our findings, operative diagnosis was also mentioned in 80%-100% (10–12, 20–23) in recent literature which is substantially higher (8-10, 14, 16-18). Variable findings were noted in closure technique where it was mentioned 97% in the UK (16), 1.67%-13.9% in Pakistan (8, 10, 17), 37% in Turkey (15), 100% in (14) Nigeria (15). Only a minority of 2%-11.4% noted if any tissue was removed or altered during surgery in Pakistani studies(8, 10), and in the Nigerian study it was mentioned as 33% (14).

Details of any prosthesis used were mentioned in 28.9% of operative notes, and the prosthesis serial number was recorded in only 1% in the present pre-intervention audit. Recent literature also showed similar figures (0.03%-15%) (9, 11, 14). In contrast, a study in the UK reported that the compliance with recording serial numbers was up to 50%, however the details of the prosthesis used were mentioned in only 10% of cases (16).

In the pre-intervention audit, signatures were noted in only 1% of operative notes, and detailed postoperative care instructions were mentioned in 36.6%. In contrast, recent literature reveals signature being documented in 82.3%-90% (10). This disparity highlights on the importance of Sri Lankan doctors placing their signature on the operative notes. Postoperative care instructions were adequately mentioned in 97% in the UK (16), and 78.5%-100% in Pakistan (10). In a study conducted in Nigeria, detailed postoperative care instructions and signatures were completed in 100% of cases, although the sample size was smaller (14). However, the quality of postoperative instructions may vary with each study, making direct comparisons challenging.

Post-Intervention Study Findings

Following the intervention, adherence to all components in writing operative notes significantly improved (table 1, table 2), which was also evident in previous studies (8, 9, 15, 16, 18). However, there was a notable bias with the

varying levels of surgeon experience, as the documentation included entries from both senior consultants and junior registrars (16).

Furthermore, in our study, post-intervention, most operative notes assessed were from elective procedures compared to the pre-intervention audit where the distribution of emergency, urgent, scheduled, and elective surgeries was approximately equal. This may have also affected the results in a positive way.

CONCLUSION

This audit evaluated adherence to RCS guidelines for operation note documentation and assessed the impact of an awareness campaign on improving compliance. The observed improvements validate the effectiveness of RCS guidelines in guiding note taking and highlight areas needing further intervention to improve documentation quality. Further studies are recommended to assess surgical staff's perceptions on operative note guidelines and to explore new methods to improve adherence to these standards. These studies should involve larger sample sizes including multiple hospitals for a more comprehensive analysis.

Author declaration

Acknowledgement

None.

Authors' contributions:

Designing the study, data collection, and manuscript writing: PGND, AGMO; Manuscript preparation and writing: RJ, WADN; Manuscript writing and editing: SW; Manuscript preparation and supervision: DA.

Conflicts of interest:

The authors declare that there is no financial or non-financial conflict of interest.

Funding statement:

Self-funded.

Ethics statement:

Ethical clearance was not obtained as it was not necessary for an audit which was done using secondary data (Institutional policy).

Statement on data availability:

Data of this study is available with the principal investigator and can be handed over on request.

REFERENCES

- Desiree RM, Kabir R. Wrist fracture management and the role of surgical care practitioner through the patient's journey. *Journal of Perioperative Practice*. 2022;32(5):115-22. DOI: [10.1177/1750458920976070](https://doi.org/10.1177/1750458920976070)
- Sahota GS, Taggar JS. The association between Situational Judgement Test (SJT) scores and professionalism concerns in undergraduate medical education. *Medical teacher*. 2020;42(8):937-43. DOI: [10.1080/0142159X.2020.1772466](https://doi.org/10.1080/0142159X.2020.1772466)
- Buck N, Devlin HB, Lunn JN, Vickers MD. The report of a confidential enquiry into perioperative deaths: King's Fund Publishing Office; 1987.
- The Royal College of Surgeons E. Record your work clearly, accurately and legibly 2014 [Available from: <https://www.rcseng.ac.uk/standards-and-research/gsp/domain-1/1-3-record-your-work-clearly-accurately-and-legibly/#resources>.
- Anderson DR, Morgano GP, Bennett C, Dentali F, Francis CW, Garcia DA, et al. American Society of Hematology 2019 guidelines for management of venous thromboembolism: prevention of venous thromboembolism in surgical hospitalized patients. *Blood advances*. 2019;3(23):3898-944. <https://doi.org/10.1182/bloodadvances.2019000975>
- Alahmadi YM, Alharbi RH, Aljabri AK, Alofi FS, Alshaalani OA, Alsdi BH. Adherence to the guidelines for surgical antimicrobial prophylaxis in a Saudi tertiary care hospital. *Journal of Taibah University Medical Sciences*. 2020;15(2):136-41. DOI: [10.1016/j.jtumed.2020.01.005](https://doi.org/10.1016/j.jtumed.2020.01.005)
- Manoucheri R, Fallahi MJ. Adherence to venous thromboprophylaxis guidelines for medical and surgical inpatients of teaching hospitals, Shiraz-Iran. *Tanaffos*. 2015;14(1):17. PMID: [26221148](https://pubmed.ncbi.nlm.nih.gov/26221148/)
- Toru HK, Aizaz M, Orakzai AA, Jan ZU, Khattak AA, Ahmad D. Improving the Quality of General Surgical Operation Notes According to the Royal College of Surgeons (RCS) Guidelines: A Closed-Loop Audit. *Cureus*. 2023;15(11). DOI: [10.7759/cureus.48147](https://doi.org/10.7759/cureus.48147)
- Mustafa MKE, Khairy AMM, Ahmed ABE. Assessing the quality of orthopaedic operation notes in accordance with the royal college of surgeons guidelines: an audit cycle. *Cureus*. 2020;12(8). DOI: [10.7759/cureus.9707](https://doi.org/10.7759/cureus.9707)
- Bhatti DS, Ahmad R, Asad A. Royal College of Surgeons guideline adherence on improvement of operative notes: a six-month closed loop audit. *Cureus*. 2020;12(5). DOI: [10.7759/cureus.7970](https://doi.org/10.7759/cureus.7970)
- Zahid MJ, Ijaz A, Hidayat W, Jan MA, Rafi H, Nawaz H, et al. Assessing Adherence to Royal College of Surgeons Guidelines: A Closed-Loop Audit of Operation Notes in a Tertiary Healthcare Unit. *Cureus*. 2023;15(9). DOI: [10.7759/cureus.45743](https://doi.org/10.7759/cureus.45743)
- Abbas S, Singh S, Sundran R, Akbari K, Gilmour J, Puttick M. A thorough note: does a procedure-specific operation note proforma for laparoscopic appendicectomy improve compliance with the Royal College of Surgeons of England Guidelines? *International Journal of Surgery Open*. 2016;2:1-5. DOI: [10.1016/j.ijso.2016.03.002](https://doi.org/10.1016/j.ijso.2016.03.002)
- Singh R, Chauhan R, Anwar S. Improving the quality of general surgical operation notes in accordance with the Royal College of Surgeons guidelines: a prospective completed audit loop study. *Journal of Evaluation in*

- Clinical Practice. 2012;18(3):578-80.
DOI: [10.1111/j.1365-2753.2010.01626.x](https://doi.org/10.1111/j.1365-2753.2010.01626.x)
14. Okoli CM, Adetula UE. Audit of post-operative notes in a Nigerian tertiary hospital: A comparison against the Royal College of Surgeons of England's Good Surgical Practice Guidelines. *International Journal of Medicine and Health Development*. 2024;29(2):88-92.
DOI: [10.4103/ijmh.ijmh_58_23](https://doi.org/10.4103/ijmh.ijmh_58_23)
 15. Bozbiyik O, Makay O, Ozdemir M, Goktepe B, Ersin S. Improving the quality of operation notes: Effect of using proforma, audit and education sessions. *Asian Journal of Surgery*. 2020;43(7):755-8.
DOI: [10.1016/j.asjsur.2019.10.002](https://doi.org/10.1016/j.asjsur.2019.10.002)
 16. Bradley R, Bremner M, McKinley A, Lammy S. Usefulness of Royal College of Surgeons of England operation note guidelines to neurosurgical practice: a closed loop audit. *British Journal of Neurosurgery*. 2021;35(4):418-23.
DOI: [10.1080/02688697.2020.1817858](https://doi.org/10.1080/02688697.2020.1817858)
 17. Hanif S, Nawaz M. An audit of operating notes in a general surgical unit: Findings and how to improve for patient well being. *Pakistan Journal of Surgery*. 2022;38(1). ISSN: 0258-8552
 18. Paul S, Govindaraj R, Govindaraj S. Surgical Operative Notes Compliance with the Standard Guidelines of the Royal College of Surgeons: A Retrospective Clinical Audit at a Tertiary Hospital in Bangalore, India. 2023.
DOI: [10.7860/IJARS/2023/64145.2938](https://doi.org/10.7860/IJARS/2023/64145.2938)