A CLOSED-LOOP CLINICAL AUDIT ON COMPLIANCE WITH ROYAL COLLEGE OF SURGEONS OF ENGLAND (RCSEng) GOOD SURGICAL PRACTICE IN OPERATIVE DOCUMENTATION: A QUALITY IMPROVEMENT STUDY

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ABSTRACT

OBJECTIVES

This audit aimed to evaluate compliance with Cesarean section documentation standards and to assess the effectiveness of a standardized pro forma with focused training.

METHODOLOGY

This audit was conducted as a pre- and post-interventional audit from February 10, 2025, to July 10, 2025, in the obstetrics department of Suleman Roshan Medical College Hospital. Using a 17-item checklist based on RCSEng Good Surgical Practice and departmental protocol, we analyzed 120 operative notes before and after implementing a standardized documentation template and operative team education. Compliance rates were calculated as percentages. Statistical comparisons were performed using the McNemar test; p-values <0.001 indicated significance.

RESULTS

The initiative significantly improved documentation ($p<0.001$). Documentation of complications increased from 10% to 99%, DVT prophylaxis recording, when applicable, rose from 0% to 100%, and details of operative findings improved from 55% to 99%. Overall, 14 of the 17 audited parameters were documented in over 95% of cases. The audit also encouraged a departmental culture that emphasizes documentation for patient safety rather than merely as an administrative duty.

CONCLUSION

The use of a structured pro forma, combined with training, enhances the completeness and quality of operative notes. This approach not only saves time but also helps ensure that crucial details are not overlooked.

KEYWORDS: *Surgical Audit, Operative Documentation, Cesarean Section, Quality Improvement*

INTRODUCTION

Adherence to Good Surgical practice is essential for ensuring patient safety and maintaining medico-legal accountability. Surgical notes serve as the official record of intraoperative events, facilitate the transfer of care, and are a vital medium for effective clinical communication. Furthermore, thorough and accurate medical records support treatment outcome assessment, development of evidence-based protocols, and insurance substantiation.[1,2] Recognizing this, *the World Health Organization (WHO) highlights the role of standardized surgical documentation, the principle reinforced by the WHO Surgical Safety Checklist.*[3] Similarly, the Royal College of Surgeons England (RCSEng) and General Medical Council (GMC) emphasize the importance of clear, legible, and contemporaneous documentation.[4,5] Despite these established standards, significant documentation deficiencies persist. A recent audit revealed that only 65% of operative notes met standards, with frequent omissions in intraoperative findings and postoperative instructions.[2] These gaps are significant in high-risk, high-litigation specialties such as obstetrics and gynecology. An audit on cesarean section documentation revealed the scale of the problem by highlighting the deficiencies in key areas, including instrument counts, postoperative plan, and neonatal data.[6] Such shortcomings can lead to delayed diagnoses and inappropriate postoperative care. Initiatives such as

the Towards Safer Childbirth report by the Royal College of Obstetricians and Gynecologists and the Royal College of Midwives have particularly called for more precise, structured documentation in obstetric practice.[7] Similarly, investigations, such as the National Patient Safety Agency's 2009 report, identified communication failures, often due to poor documentation, as a major preventable factor in patient safety incidents.[8] Targeted interventions, including educational training and the use of standardized tools such as proformas, have been shown to improve compliance.[9] These measures represent a practical way forward to bridge the gap between policy and practice, ensuring that operative documentation fulfills its vital role in safe, effective, and accountable patient care. Studies from Pakistan have shown notable inadequacies in surgical documentation when audited against international standards.[2,6,10,11,12] However, such structured evaluation is lacking in our setting. This comprehensive clinical audit, therefore, aims to assess compliance with global documentation standards and departmental protocols within our obstetrics department at Suleman Roshan Medical College Hospital, and to evaluate the impact of implementing a standardized proforma on the completeness and quality of operative notes.

METHODOLOGY

This closed-loop clinical audit was conducted in the Gynecology and Obstetrics Department of Suleman Roshan Medical College Hospital from February 10, 2025, to July 10, 2025. Ethical approval was obtained from the Institutional Review Board (Reference: SRMC/PRINCIPAL/067). A consecutive sampling technique was used to include all operative notes until the target sample size was attained, fulfilling the inclusion criteria for Cesarean Sections (CS), whether elective or emergency, performed during the audit period, regardless of patient age, parity, or fetal number (singleton or multiple pregnancies). C/S performed outside the audit period were excluded. The study followed a three-phase approach: an initial retrospective review of 120 operative notes; an intervention phase involving brief educational training for doctors, medical officers, and house officers who usually handle paperwork, together with the introduction of a standardized proforma; and a prospective re-audit of 120 notes to evaluate improvements. Documentation was assessed against 17 predefined parameters using an audit tool checklist aligned with RCSEng standards and departmental protocol, shown in annexure A.[4] Two trained departmental doctors collected the data, and inter-rater reliability was ensured through a review and consensus meeting to standardize the application of the audit tool. Patient data were anonymized using unique identifiers to ensure confidentiality, with no personally identifiable information included in the analysis. Data was entered into Microsoft Excel and analyzed using SPSS version 23. Compliance rates for each parameter were calculated as frequencies and percentages. The McNemar test was used to compare paired pre- and post-intervention proportions; p-values less than 0.001 were considered statistically significant. Following the initial audit, findings were presented to the local audit committee, and recommendations, along with the standardized pro forma, were disseminated through departmental meetings and training sessions. The re-audit results were analyzed to measure the impact of interventions and conclude the audit cycle.

RESULTS

Initial Audit

The initial audit of 120 operative notes identified gaps in compliance with the RCSEng Good Surgical Practice guidelines. Important clinical parameters were missing, even though basic details such as the surgeon's name and the date were recorded in all notes. Documentation of surgical wound closure details was absent from all records (0%); intraoperative problems were documented in 10%; and any further procedures, whether carried out or not, were documented in 30%. Only 55% of notes mentioned the type of uterine incision, and 40% mentioned the baby delivery maneuver used.

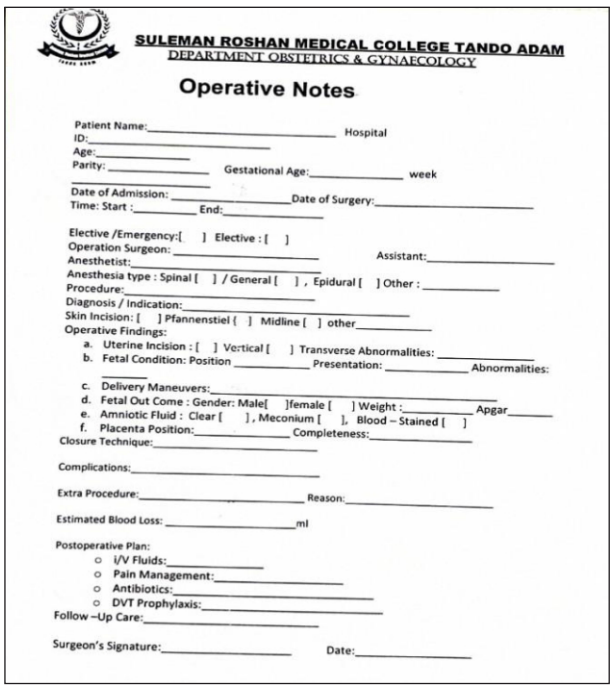
Re-Audit Post-Intervention

Following the educational training session with the department's team on initial audit findings and the implementation of a standardized proforma in accordance with RCSEng and departmental protocol, as shown in Figure 1, the re-audit of 120 notes demonstrated significant improvements in documentation quality. Significant improvements were observed in the previously deficient areas: documentation of surgical closure and complications each increased to 99%, and the recording of additional procedures reached 100%. Compliance for specifying the uterine incision type and delivery maneuvers improved to 98% and 99%, respectively. Statistically, the McNemar test confirmed that improvements for 16 of the 17 audited standards were highly significant ($p<0.001$). The exception was the documentation of fetal outcome, which maintained a high baseline compliance of 98% in both audit phases. Overall, the post-intervention results confirmed that 14 parameters exceeded 95% compliance, with 10 achieving 100%, successfully closing the audit loop and demonstrating the efficacy of the implemented interventions. Table 1

shows a comparison of pre- and post-intervention compliance with RCSEng documentation standards.

Table 1: Comparison of Pre- and Post-Intervention Compliance with RCSEng Documentation Standards

Documentation of Parameter Evaluated	Frequency in Initial Audit Cycle (n=120)	Frequency in Re-audit Cycle (n=120)	Observed Change	P-Value
Date and time	95%(114)	100%(120)	+05%	<0.05
Elective/emergency procedure	74%(89)	99%(119)	+25%	<0.001
Names of the operating surgeon and assistant	100%(120)	100%(120)	00%	No Change
Name of the theatre anesthetist	97%(116)	100%(120)	+03%	<0.05
Type of anesthesia used	97%(116)	100%(120)	+03%	<0.05
Operative procedure carried out	100%(120)	100%(120)	00%	No Change
Operative diagnosis / Indication for Surgery	94%(113)	100%(120)	+06%	<0.01
Skin Incision type	60%(72)	99%(119)	+39%	<0.001
Operative findings				
a) Uterine incision (vertical/transverse) Note any abnormalities (e.g., adhesions)	55%(66)	99%(119)	+44%	<0.001
b) Fetal condition: Position, presentation, and abnormalities.	85%(102)	100%(120)	+15%	<0.01
c) Delivery of the baby: Maneuvers used.	40%(48)	98%(118)	+58%	<0.001
d) Fetal outcome: Gender, baby weight, Apgar score	98%(118)	100%(120)	+02%	>0.05
e) Amniotic fluid color.	80%(96)	100%(120)	+20%	<0.001
f) Placental position and completeness	84%(101)	100%(120)	+16%	<0.01
Details of the closure technique	00%(00)	90%(108)	+90%	<0.001
Any problems/complications (if applicable)	10%(12)	99%(119)	+89%	<0.001
Any extra procedure performed, and the reason (if applicable)	30%(36)	99%(119)	+69%	<0.001
Anticipated blood loss	60%(72)	97%(116)	+37%	<0.001
Postoperative Plan				
a) IV fluids	100%(120)	100%(120)	00%	No Change
b) Pain management medications.	100%(120)	100%(120)	00%	No Change
c) Antibiotic prophylaxis	100%(120)	100%(120)	00%	No Change
d) DVT prophylaxis (if applicable)	00%(00)	100%(120)	+100%	<0.001
Follow-Up Care	70%(84)	98%(118)	+28%	<0.001
Signature	80%(96)	100%(120)	+20%	<0.001



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Operative Notes

Patient Name:_____ Hospital ID:_____
Age:_____
Parity:_____ Gestational Age:_____ week
Date of Admission:_____ Date of Surgery:_____
Time: Start :_____ End:_____

Elective /Emergency:[ ] Elective : [ ]
Operation Surgeon:_____ Assistant:_____
Anesthetist:_____
Anesthesia type : Spinal [ ] / General [ ] , Epidural [ ] Other : _____
Procedure:_____
Diagnosis / Indication:_____
Skin Incision: [ ] Pfannenstiel [ ] Midline [ ] other_____
Operative Findings:
a. Uterine Incision : [ ] Vertical [ ] Transverse Abnormalities: _____
b. Fetal Condition: Position _____ Presentation: _____ Abnormalities: _____
c. Delivery Maneuvers:_____
d. Fetal Out Come : Gender: Male[ ]female [ ] Weight :_____ Apgar_____
e. Amniotic Fluid : Clear [ ], Meconium [ ], Blood – Stained [ ]
f. Placenta Position:_____ Completeness:_____
Closure Technique:_____
Complications:_____
Extra Procedure:_____ Reason:_____
Estimated Blood Loss: _____ml
Postoperative Plan:
- i/V Fluids:_____
- Pain Management:_____
- Antibiotics:_____
- DVT Prophylaxis:_____

Follow –Up Care:_____
Surgeon's Signature:_____ Date:_____

Figure 1: Standardized Cesarean Section Notes Proforma Implemented During Re-Audit

DISCUSSION

Clinical audit, as a key component of clinical governance, provides the framework for evidence-based improvement. We put this cycle into practice by first identifying and then addressing major flaws in surgical documentation, using the RCSEng Good Surgical Practice guidelines as a benchmark alongside departmental standards. This approach demonstrates the audit methodology's dual role in certifying care quality while driving targeted quality improvement.[13] By regularly revisiting these standards, we ensure that our practices remain aligned with the latest evidence and best practices in the field. An audit at a UK hospital revealed nearly perfect documentation of essential aspects of surgery: the operating surgeon's name was recorded in 99.3% of cases, while the date of operation and procedure title were documented in 99.1%.[14] Whereas an audit in Malawi found that only the date and the surgeon's name were consistently recorded at 100%, crucial information such as case urgency, blood loss, complications, and additional procedures revealed significant gaps in the documentation, which were statistically significantly improved in the re-audit

cycle.[15] In comparison, our audit analysis found that, across both audit cycles, there was consistent documentation of operating team names, surgical procedure details, and standard postoperative orders for intravenous fluids, analgesia, and antibiotic prophylaxis. This consistent documentation suggests these elements constitute institutionalized practice norms. Notably, parameters such as anesthesia type and fetal outcome details, which already began with high baseline compliance, showed further marginal improvement from 97-98% to 100%. This highlights established good clinical documentation practices. The initial audit revealed that documentation of DVT prophylaxis was absent from all operative notes. After the structured pro forma was introduced, writing reached 100% compliance. This deficit aligns with the findings of Khan et al. (2010) and Khalid et al. (2022). This similarity in audit results raises the possibility that the initial omission resulted from a clinical workflow pattern in which prophylaxis decisions are routinely deferred until the postoperative round, allowing for evaluation of bleeding risk and patient stability.[11,12,13,14,15,16] Our initiative replaced handwritten notes with printed proformas, a change supported by evidence that such standardized templates improve clinical communication by reducing documentation variability and errors.[17] Illegible handwriting is again a recognized barrier to effective clinical communication, as it can render a record unusable, negating the fundamental principle that care must be documented to be acknowledged.[18] In our re-audit cycle, the legibility of notes was observed to increase from 75% to 95%. By providing clear boxes to fill in instead of blank pages, the new form made the notes clearer. It also helped prevent important details from being missed when doctors were exhausted, fatigued, or overburdened by heavy workloads, which are common in obstetric and surgical settings.

LIMITATIONS

The limitations of this audit are that it was conducted at a single center, which may restrict the generalizability of the findings to other institutions with different workflows or resources. Second, the re-audit was performed over a short-term follow-up period, leaving the long-term sustainability of the improvements unknown. Third, the post-intervention design is susceptible to bias, including the Hawthorne effect, in which participants may alter their behavior when being observed.

CONCLUSIONS

Implementing a standardized pro forma and an educational training session improved documentation compliance, reduced writing time, and decreased clinicians' cognitive load. These findings validate the effectiveness of structured quality improvement initiatives and audits in enhancing practices. The observed optimization resulted in effective clinical communication, streamlined handovers, and, ultimately, a foundation for safer patient care. This study highlights the importance of ongoing monitoring to ensure sustained adherence. Future research should evaluate the long-term durability of these improvements, replicate documentation audits in other clinical areas, and compare the efficacy of structured paper proformas with electronic documentation systems.

AUDIT CHECKLIST:

Age: _____
Parity: _____
Gestational age: _____ weeks |
Date of Admission: _____ Date of Surgery: _____
Healthcare Practitioner post:_____
Time of Audit: Pre_____ Post_____
Overall Compliance: Yes____ No___

ANNEXURE A

Parameter	Details	Noted	
Clear and legible handwriting	Ensure all entries are readable	Clear	Illegible
Date and time	Ensure all entries are readable	Missing	Complete
Elective/emergency procedure	Specify whether the procedure was elective or emergency	Specify	Not Specify
Names of the operating surgeon and assistant	Include full names and roles	Missing/incomplete	Complete
Name of the theatre anesthetist	Record the anesthetist's name.	Missing	Complete
Type of anesthesia used	Specify the type (e.g., spinal, general, epidural)	Mentioned	Not Mentioned
Operative procedure carried out	Name the procedure performed: Cesarean Section	Correctly Specify	Incorrect
Operative diagnosis/Indication for Surgery	State the diagnosis and reason for the Cesarean Section.	Stated	Not Stated
Skin Incision type	Specify the type of skin incision (e.g., Pfannenstiel, midline)	Specify	Not Specify
Operative findings	a) Uterine incision (vertical/transverse); note any abnormalities (e.g., adhesions, scarring).	Completely Specify	Incomplete
	b) Fetal condition: Position, presentation, and abnormalities.	Completely Specify	Incomplete
	c) Delivery of the baby: Maneuvers used.	Completely Specify	Incomplete

Table continued...

	d) Fetal outcome: Gender, baby weight, Apgar score.	Completely Specify	Incomplete
	e) Amniotic fluid color.	Completely Specify	Incomplete
	f) Placental position and completeness.	Completely Specify	Incomplete
Details of the closure technique	Describe the technique used for closure	Describe	Not Describe
Any problems/complications	Any intraoperative or immediate postoperative complications.	Reported	Not Reported
Any extra procedure performed, and the reason	Specify additional procedures (e.g., tubal ligation, cystectomy) and reasons.	Specify	Not Specify
Anticipated blood loss	Estimate the blood loss during the procedure.	Estimate	Not Estimate
Postoperative Plan	a) I/V fluids.	Mentioned	Not Mentioned
	b) Pain management medications.	Mentioned	Not Mentioned
	c) Antibiotic prophylaxis.	Mentioned	Not Mentioned
	d) DVT prophylaxis (if applicable).	Mentioned	Not Mentioned
Follow-Up Care	Any special instructions or concerns for postoperative care?	Mentioned	Not Mentioned
Signature	Signature of the operating surgeon	Yes	No

Standardizes Proforma and Audit Tool Checklist:

Parameter	Details
Clear and legible handwriting	Ensure all entries are readable.
Date and time	Ensure all entries are readable.
Elective/emergency procedure	Specify whether the procedure was elective or emergency.
Names of the operating surgeon and assistant	Include full names and roles
Name of the theatre anesthetist	Record the anesthetist's name.
Type of anesthesia used	Specify the type (e.g., spinal, general, epidural)
Operative procedure carried out.	Name the procedure performed: cesarean section.
Operative diagnosis/Indication for Surgery/Cesarean Section	State the diagnosis and reason for the Cesarean Section.
Skin Incision type	Specify the type of skin incision (e.g., Pfannenstiel, midline).
Operative findings	a) Uterine incision (vertical/transverse); note any abnormalities (e.g., adhesions, scarring). b) Fetal condition: Position, presentation, and abnormalities. c) Delivery of the baby: Maneuvers used. d) Fetal outcome: Gender, baby weight, Apgar score. e) Amniotic fluid color. f) Placental position and completeness.
Details of the closure technique	Describe the technique used for closure.
Any problems/complications	any intraoperative or immediate postoperative complications.
Any extra procedure performed, and the reason why	Specify additional procedures (e.g., tubal ligation, cystectomy) and reasons.
Anticipated blood loss	Estimate the blood loss during the procedure.
Postoperative Plan	a) I/V fluids. b) Pain management medications. c) Antibiotic prophylaxis d) DVT prophylaxis (if applicable).
Follow-Up Care	Any special instructions or concerns for postoperative care?
Signature	signature of the operating surgeon

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Sakeena Ahmed *- Concept & Design; Data Acquisition; Drafting Manuscript; Critical Revision; Supervision; Final Approval*

Nusrat Jameel *- Concept & Design; Data Acquisition; Drafting Manuscript; Critical Revision; Final Approval*

Nazia Azam Yousfani *- Concept & Design; Data Acquisition; Data Analysis/Interpretation; Drafting Manuscript; Critical Revision; Supervision; Final Approval*

The authors accept responsibility for all aspects of the work and will ensure that any concerns regarding the accuracy or integrity of any part are properly investigated and resolved.