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Audit of Operation Notes in Plastic and Reconstructive Surgery Unit, All Africa Leprosy Tuberculosis and Rehabilitation Training center (ALERT) Hospital

A thesis to be submitted to Plastic and Reconstructive Surgery Unit of Department of Surgery, Addis Ababa University School of Medicine, in partial fulfilment for the certificate of specialty in Plastic and Reconstructive Surgery

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Abbreviations

- RCSEng GSP- Royal College of Surgeons 'Good Surgical Practice'
- UK- United Kingdom
- WHO- World Health Organization
- ALERT- All Africa Leprosy, Tuberculosis and Rehabilitation Training Center
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Abstract

Introduction: High quality operation notes are one of the most crucial parts of patient care as it is a means of communication among professionals, source of data for audits and researches, and

a source of information in court. The Royal College of Surgeons of England has produced a guideline in 2014 that outlines the minimum standards that need to be documented on operation notes. This study aims to assess the adherence of ALERT hospital plastic and reconstructive unit to these guidelines.

Objectives: To evaluate operation notes in the plastic and reconstructive unit of ALERT hospital against RCSEng GSP 2014 standards, identify causes of incompleteness and suggest possible ways of improvement in the quality of operation notes.

Methods: The study is conducted, plastic and reconstructive unit of ALERT hospital. It is a cross sectional retrospective study conducted using stratified random sampling of 341operation notes written since April 1, 2020, supplemented by survey questionnaire administered to 22 doctors (consultants, fellows and residents) to assess their experience and opinion regarding operation note standards.

Results: None of the RCSEng GSP 2014 standards were consistently documented. Only 3 standards were documented in more than 90% of operation notes. Most operation notes were written by residents. Survey questionnaire administered results showed the participants believe that lack of quality of operation notes affects follow up and future interventions for patients. More than 95% of the respondents reported that they do not write all the standards consistently and most commonly attributed reasons are absence of formal education on the subject and operation note proforma incompleteness according to the standard. Among the measures suggested by the survey participants to improve the quality of operation note include introduction of formal teaching about operation note writing, updating the existing operation note proforma to include the RCSEng GSP 2014 standards and educating the staff about the standards.

Conclusion: Operation notes in plastic and reconstructive surgery unit of ALERT hospital are not up to standard per RCSEng GSP 2014 guideline. Formal education, update of existing operation note proforma, posting aide memoires in the operation theatres and clinical education of the staff about the standards are some of the proposed solutions to improve the quality of the operation notes.

- **Introduction**
    - **Background**

Apart from treating a patient one of the most essential part of patient care is precise, thorough and accessible documentation of medical records, one element of this being operation notes.(1,2) High quality operation notes are crucial in post-operative management of surgical patients, serving as the main means of communication among professionals.(3) It is also vital source of data for audit of operation notes and hence a great research tool.(4) It also has great legal implications as it can be called upon in courts.(1)

The Royal College of Surgeons of England (RCSEng) has produced a guideline in 2008, later reviewed in 2010 and 2014, that outlines the minimum standard of documentation to be found in operation notes. The guideline titled 'Good Surgical Practice' states that it is the surgeons' responsibility to "ensure that accurate, comprehensive, legible and contemporaneous records are maintained of all of their interactions with patients". The 2014 guideline includes the following standards to be written down, preferably typed.(5)

- Date
- Time
- Elective or emergency procedure
- Name of operating surgeon and assistant
- Name of theatre anesthesiologist
- Operative procedure
- Incision
- Operative diagnosis
- Operative findings
- Any problems or complications
- Any extra procedures performed and reason why it was performed
- Details of tissue removed added or altered
- Identification of any prosthesis used including serial numbers of prosthesis and other implant materials

- Details of closure technique
- Anticipated blood loss
- Antibiotic prophylaxis
- Venous Thromboembolism prophylaxis
- Detailed post-operative care instructions
- Signature

- **Statement of the Problem**

The Royal College of Surgeons of England outlines the main components of an operation note in the guideline titled 'Good Surgical Practice' (GSP) that is revised in 2014. It states that surgeons have the major leadership role in making sure that the operation notes are maintained up to the standard.(5)

Audits with regards to adherence to this guideline were conducted in different centers globally showing suboptimal adherence.(4,6–8) A study conducted in Africa also showed similar results, with poor documentation of operation notes in general surgery department of a major teaching and referral hospital in Malawi.(3) Compliance to the standard in Ethiopia is also found to be poor in a study that evaluated the practice of operation note writing in general surgery department in major referral and teaching hospitals under Addis Ababa University.(9)

The quality of operation notes has been assessed in different surgical departments. Studies conducted in orthopedics, pediatric surgery, ENT surgery, general surgery and plastic and reconstructive surgery departments showed that there is significant gap in fulfilling the criteria set by the RCS on GSP 2014 and the audit loops also showed simple and effective ways to improve these gaps. Presentation of the audit results, formal teaching of operation note writing in residency, introduction of aide memoire in operation theatre and proforma of the checklist on operation notes were some of the measures that showed significant improvements in documentation.(1,3,4,6,7,10–13)

Plastic and reconstructive surgery is one of the subspecialties in surgery where written as well as photographic documentation is most important for effective management of patients.(14) There are only few studies thus far assessing GSP guideline implementation with regards to this specialty. Findings of a study done in a UK burns center suggested that completeness of operation notes was suboptimal. Following presentation of this result and introduction of specialty based checklists, significant improvement was seen in completeness of documentation.(12)

There are no studies conducted regarding the completeness of operation notes in the plastic and reconstructive surgery centers in Ethiopia. No national or institutional guidelines are set to ensure the upholding of quality of operation notes. This study aims to assess the adherence to RCS guidelines regarding operation notes in ALERT hospital plastic and reconstructive surgery unit in Addis Ababa, Ethiopia.

- **Literature Review**

Using a standard set of guidelines enables professionals to keep complete medical records and reduce errors. (11) The guideline prepared by the Royal College of Surgeons of England under the title 'Good Surgical Practice' states the standards of documentation to enable the operation notes be a lucid and complete source of information regarding the operative procedure undertaken, the expected standard of completeness being 100%.(5)

Audit of the operation notes of different surgical departments is conducted globally and found to be incomplete in all studies with regards to the RCSEng standards. Parwaiz et al. and Atif et al. evaluated the completeness of operation notes in general surgery departments in the UK and Pakistan respectively and found it to be suboptimal. Parwaiz et al found the documentation of the time, whether elective or emergency procedure, estimated blood loss and antibiotic and venous thromboembolism prophylaxis to be less than 50%.(1) Atif et al found only two standards, namely the procedure and name of the surgeon were filled up in all operation notes.(11) Other studies conducted in pediatric surgery, ENT and orthopedics departments in the UK hospitals revealed the poor documentation up to the standards set in GSP.(6,10,13)

Audits of practice in the plastic and reconstructive surgery departments in the UK have also been carried out and results were comparable to findings in other departments. Khajuria et al. found that only the date, surgeon's name and name of operation were written consistently. (12) In the study conducted by Rogers et al, none of the standards were met, with diagnosis and operative findings documented in only 70.8% and 75.9% respectively.(7)

Assessment of operation notes in different surgical units of referral and teaching hospital in Malawi also showed incomplete documentation of the components of the RCSEng GSP guidelines. This study demonstrated that the name of patient and operating surgeon were the only two standards written 100% of operation notes. Time of procedure was not documented in any of the operation notes. The age, date, name of assistant, scrub nurse and anesthetist were written inconsistently.(3)

Some researches tried to investigate the reason for incompleteness of operation notes. Deficiencies in operation note completeness is seen in a study done in general surgery department of 2 referral hospitals under Addis Ababa University in Ethiopia that investigated 348 operation notes and found them to be incomplete with regard to the RCSEng guidelines in all standards. Most operation notes were written by residents in both hospitals under the study. The incompleteness of the operation notes written by residents can be attributed to absence of formal training in residency on operation note writing and the study recommends operation notes to be written by the most senior member of the operating team. There was also huge difference in documentation of name of anesthetist in the 2 hospitals (88.5% vs5.7%) which was attributed to the difference in operation note format of the 2 hospitals. (9)

The presence of missing information on other parts of the medical records can be another reason for their lack of documentation on operation notes. Parwaiz et al attributed the in deficiency in documentation of some information due to their presence in other parts of the chart like the anesthetic chart or World Health Organization Surgical Safety Checklist.(1) In addition surgeons might not be writing negative factors instead of writing 'not done' or 'not given'.(13) A study done in plastic and reconstructive surgery unit deemed some standards of the RCSEng like prosthertic materials not to have significant role for the specialty. It attributed the lack of specialty-specific guideline as a problem and concluded that the guideline needs to be discussed among professionals and revised before applying the standard as it is stipulated in the RCSEng which might lead to misinterpretation of operation standards.(7)

Given the gap in proper documentation of operation notes worldwide, introducing a formal training in operation note writing incorporated in the surgical training program could be important measure to tackle the problem. (3,17) Borchert et al studied the attitudes of different level doctors on the teaching of operation note writing and found that 93.7% of respondents believe that teaching operation notes to trainees is important and 64.1% believe that 'learn-by-doing' is inappropriate way of operation note writing. Despite this more than three quarters of the respondents (76.6%) never received formal instructions in operation note writing and trainers are not convinced that they introduce their trainees into writing operation notes.(17)

The use of aide memoire in operation theatres to improve documentation on operation notes has been described in different studies done in various surgical departments. Sharyan et al conducted

an audit loop study on total of 201 operation cards in otolaryngology department. After an initial audit of 100 operation notes, they found out that all the RCSEng GSP guideline standards were not met with assistant's name, diagnosis, incision type and wound closure documented in less than 90% of the operation notes. After introduction of aide memoire, there was 100% documentation in patient identification, post-operative instructions, assistant, diagnosis, incision type, wound closure and operative finding. (6) Rogers et al studied 137 operation notes in plastic and reconstructive surgery department in the UK and found 100% adherence rate to the guideline in 5 of the standards; name of operating surgeon, procedure, diagnosis, finding, post-operative instructions; with the use of aide memoires. (4)

As seen in a study in referral hospital in Malawi, updating existing operation note proforma with specific reminders on different components of RSCEng guideline results in better adherence. The study found significant improvements in documentation of whether emergency or elective procedures, estimated blood loss, presence of complications and presence of extra procedure done after undertaking the update.(3)

Another audit loop study conducted in pediatric surgery department also demonstrated that documentation of operation note was found to be substandard in first audit after which areas of improvement identified. Clinical education on the guideline given and audit result communicated with the staff members. Proforma based on RCSEng standards introduced and the study audited the effect of utilization of these measures on the quality of operative notations and found that there was significant improvement after the interventions and also suggested that there is better outcome with education and proforma together than education alone.(10)

Clinical education and regular audit of operation notes are also simple aids used for the improvement of adherence to standards as seen in number of studies (1,3,6). Presentation of audit result, discussing the guideline and introducing typed operation notes resulted in significant improvements in completeness of standard and legibility as seen in audit loop study in orthopedics department done by Whitehead-Clark et al.(8)

Revision of the operation note proforma and making the proforma be available electronically are found to have the highest impact in improving the legibility (15) and completeness of operation notes.(1,12) Prospective study conducted on 1092 operation notes in the orthopedics department in UK to assess the quality of operation notes found out that hand written documentation is found

to be better significantly in only 2 of the standards , procedure and whether elective or emergency. There was better documentation of time, identification of patient, assistant, diagnosis, incision, operative finding, additional procedures and post-operative instructions in typed notes. (13) Electronic recording of operative notes enables professionals to access their own or fellow professional's notes remotely and allow for fast intervention in the absence of operating surgeon. It also allows for documentation of findings in photographs for better understanding, which is crucial in specialties like plastic and reconstructive surgery.(16) Finding the financial support to increase the number of computers, train professionals and purchase of software could be limitations to advance to electronic documentation in this time of economic austerity.(4)

Parwaiz et al used a combination of clinical education, aide memoire and revision of proforma to significantly improve the completeness of the operation notes in general surgery department in the UK. Although only one of the standards met 100%, there was a dramatic change in completeness in documenting time, whether emergency or elective, complication, estimated blood loss, antibiotic and venous thromboembolism prophylaxis.(1)

In addition to proper documentation according to RCS guidelines, photographic documentation is found to have monumental importance in different specialties, plastic and reconstructive surgery in particular. It provides visual representation of the disease process in tumors with poorly defined margins to help the pathologist to show correct orientation of specimen and radiologist to plan the radiation field. In microsurgery, it helps to visualize the position of anastomosis of vessels and relationship of surrounding structures before undergoing re-exploration if need be. Post debridement pictures of limb traumas helps in planning soft tissue coverage and discuss with other specialty colleagues easily. It also helps in giving extra information in the post-operative dressing change by helping anticipate sites of drainage under dressings. (14,18)

- **Objective**
    - **General Objective**

To assess operation notes in Plastic and Reconstructive Surgery Unit of ALERT hospital against standards set by the RCSEng ‘Good Surgical Practice 2014’ guideline.

- **Specific Objective**

- Evaluate operation notes in plastic and reconstructive surgery department of ALERT hospital with regards to the standards set on RCSEng GSP 2014 guideline
- To identify possible causes of incompleteness of operation notes in the department
- To suggest possible solutions for improvement in documentation on operation notes

- **Methodology**

- **Study setting**

The study was conducted in ALERT hospital located in Addis Ababa, Ethiopia. It is one of the pioneers in establishing plastic and reconstructive surgery service in the country. It is one of the first plastic and reconstructive surgery training centers in the country with affiliation to Addis Ababa University School of Medicine in giving postgraduate subspecialty training in plastic and reconstructive surgery. The hospital serves as one of the few referral centers for plastic and reconstructive surgery in the country. It has currently 3 operating tables and 3 wards.

- **Study design**

The study is a cross sectional retrospective study that was conducted after using stratified random sampling of operation notes, supplemented by survey questionnaire administered to consultant plastic and reconstructive surgeons, fellow surgeons and resident surgeons to assess their experience and opinion regarding operation note standards.

- **Source population**

Operation notes that were written for plastic and reconstructive procedures done in ALERT hospital were collected.

All consultant surgeons, fellow surgeons and residents working in ALERT hospital were requested to participate in survey.

- **Study Population**

  - Total of 400 operation notes written for procedures done since April 1, 2020 were collected.

- Total of 6 consultant surgeons, 2 fellow surgeons, 6 5th year residents, 4 4th year residents, 7 3rd year residents were requested to participate by filling survey questionnaire.

4.1 Inclusion criteria

- Operation notes written on proforma or on history or continuation sheets.

- All consultant surgeons, fellow surgeons and residents in the unit available and consenting to fill out survey questionnaire

4.2 Exclusion criteria

- Operation notes not found in cards

- Consultant surgeons, fellow surgeons, residents not consenting or available at time of survey.

- **Sampling**

The first 400 card numbers written in the plastic and reconstructive surgery department since April 1, 2020 were retrieved from major and trauma center operation theatre log books.

All available and consenting consultant surgeons, fellow surgeons and residents were asked to fill out survey questionnaire form.

- **Data collection**

The card numbers of the 400 operated patients since April 1, 2020 were collected from the log books in major and trauma operation theatres and cards were retrieved from card room. Secondary qualitative and quantitative data was collected by 3rd year residents of plastic and reconstructive surgery unit through chart review and 341 operation notes were able to be fulfill the inclusion criteria. The data was collected using the RCSEng GSP 2014 guideline for completeness of components on the checklist prepared for data collection.

Self-administered questionnaire is also administered to consultant surgeons, fellow surgeons and residents currently practicing in ALERT hospital plastic and reconstructive unit after getting oral consent.

- **Quality assurance**

The researcher oversaw all activities and made sure each part of the research activity is carried out up to standard. This consisted of data editing and data entry to detect unanswered questions and irregularities, to eliminate errors like double answers.

- **Data Analysis**

The data was analyzed after discussing descriptive statistics and also research findings, based on cross-sectional study used to test the study hypothesis that assesses operation notes in plastic and reconstructive surgery unit of ALERT hospital against standards set by RCSEng GSP 2014 guideline and assess the experience and opinion of consultant surgeons, fellow surgeons and residents regarding current practice. The study used frequencies and percentages to attain the objective. These statistics were presented using frequency tables. Descriptive statistics were useful in identifying patterns and trends in the data that served as a basis for assessment of quality of operation notes. Before carrying out data analysis, the collected data was cleared, errors identified and corrected. Data coding was done to translate other data types to numeric codes to ensure quick data entry and facilitate analysis. The data was analyzed using Statistical Packaging for Social Sciences (IBM SPSS Statistics Version 19).

- **Ethical Concerns**

  The ethical clearance was issued from Addis Ababa University, College of Health Science, Institutional Review Board and data was collected after permission is obtained from administration of ALERT hospital. An introductory letter was attached to the survey questionnaires that explain the purpose and significance of the research, request for participation while giving assurance for privacy and confidentiality of information collected.

- **Result**

  The first part of research tried to evaluate the operation notes with regard to the RCSEng GSP 2014 standards. Out of the 341 operation notes revised, none of the RCSEng standards were filled 100%. The date, post- operative instructions and signature were the 3 standards completed in more than 90% of the operation notes (97.1%, 97.7%, and 99.7% respectively).

  Anticipated blood loss, whether operation is elective or emergency procedure, provision of venous thromboembolism prophylaxis were not documented in any of the operation notes. Time of operation, identification of prosthesis and implant materials and antibiotic prophylaxis were found written in less than 1% of the notes.

  The number of operation notes found to contain operative procedure and diagnosis were 255 and 295 respectively, accounting for 74.8% and 86.5% of the notes

respectively. Name of the operating surgeon was documented on 86.2% of the operation notes.

While the name of the assistant was completed on 187 of operation note formats and name of anesthetist on 167 of notes, accounting for 54.8% and 49% respectively. Operation note findings and details of tissue altered, added or removed were included in around half of the operation notes (51.3%, 51.6% respectively)

Ninety three of the operation notes have been found to include incision type in their operation notes accounting for 27.3%. Details of closure technique were documented in only 65 of the 341 operation notes revised. (19.1%)

Presence of complication, any extra procedure performed were stipulated in 5(1.5%) and 11(3.2%) of the 341 operation notes evaluated.

Table 1- Operation notes evaluation according to RCSEng GSP 2014

Operation Standard	% of Documented Standard	Frequency
Date of operation	97.1	331
Time of Operation	0.3	1
Elective or Emergency Procedure	0	0

Name of Operating Surgeon	86.2	294
Name of Assistant	54.8	187
Name of Anesthetist	49	167
Operative Procedure	74.8	255
Incision	27.3	93
Operation Diagnosis	86.5	295
Operative Finding	51.3	175
Any Complications	1.5	5
Any extra procedure performed and reason why performed	3.2	11
Details of tissue removed, added or altered	51.6	176
Identification of any prosthesis used	0.6	2
Details of closure technique	19.1	65
Anticipated blood loss	0	0
Antibiotic prophylaxis	0.9	3
Venous thromboembolism prophylaxis	0	0
Detailed post-operative care instruction	97.7	333
Signature	99.7	340

Anesthetic sheets and WHO Surgical Safety Checklist were also evaluated if they contain any information regarding those that are missing on the operation notes. Three of the anesthetic sheets were found to contain information regarding the date of information despite it being absent on 10 of the operation notes. Time of operation is also found on 54 anesthetic sheets despite not being documented on 340 of operation notes. The information regarding elective or emergency nature of the surgery was documented in 16 of the anesthetic sheets despite being not documented

in any of the operation notes. One anesthetic sheet contained information regarding the name of anesthetist from the 135 not documented on the operation note. Three anesthetic sheets contained information regarding operative procedure, from the 86 operation notes without the operative procedure documented. And regarding anticipated blood loss, 7 of the anesthetic sheets contained information from the 341 missing on corresponding operation notes and those with information regarding antibiotic prophylaxis were found to be 24 out of this missing information in the corresponding 338 operation notes.

Similar comparison was done between missing information on operation note and those standards found documented on WHO Surgical Safety Checklist. The date of operation was found to have been documented on 3 of the checklist despite being absent on the operation note. Time of operation is also documented on 39 of the corresponding checklist despite being absent in 340 operation notes. Elective or emergency nature of the surgery was documented on 11 of the surgical safety checklist despite not being present in any of the operation notes. From the 47 operation notes with missing information regarding name of the surgeon, 3 were found on the corresponding surgical safety checklist. Two of the missing name of assistants and 2 names of anesthetists were found on surgical safety checklist despite being missing in 135 and 50 of the operation notes respectively. From the 86 operation notes not containing operative procedure, 1 was found in corresponding surgical safety checklist. With regard to anticipated blood loss and antibiotic prophylaxis, 49 and 40 anesthetic sheets were found to contain the missing information in operation notes, with 341 and 338 operation notes missing the information respectively.

Table 2- Operation note standards missing in operation notes and present in anesthetic sheet and WHO surgical safety checklist

Operation note standard	Frequency of missing documents	Frequency of those available on anesthetic sheet	Frequency of those available in WHO surgical safety checklist
Date of operation	10	3	3
Time of operation	340	54	39
Elective /Emergency	341	1	11
Name of anesthesist	135	1	2
Operative procedure	86	3	1
Anticipated blood loss	341	7	49
Antibiotic prophylaxis	338	24	40
Name of surgeon	47		3
Name of assistant	50		2

Consultant Surgeons wrote only 3 of the operation notes while fellow surgeons wrote 21 of the 341 operation notes. Most operation notes were written by 4th year plastic and reconstructive surgery residents accounting for 44% of notes, followed by 3rd year residents with 35.8% of the operation notes. Final year residents wrote 38 of the 341 operation notes and general practitioners wrote on 7 of the notes (11.1% and 2.1% respectively).

Table 3- Operation notes written per level of education

Level of Education	Percent of operation notes written	Frequency
Consultant Surgeon	0.9	3
Fellow Surgeon	6.2	21
5th year Resident	11.1	38

4th year Resident	44	150
3rd year Resident	35.8	122
General Practitioner	2.1	7

Figure 1- Operation note written per level of education

In the second part of the study, total of 22 physicians consented to participate in the survey in the form of self-administered questionnaire regarding their knowledge about operation note standard. Four consultant surgeons, 2 fellow surgeons and 16 residents participated in the survey..

Twelve of the participants in the survey were male and 10 were female accounting for 54.5% and 45.5% respectively. More than 70% of the participants are between the ages of 30-39 years (72.7%) while 22.7% of the participants are within the range of 20-29 years of age.

Table 4- Age distribution of survey participants

Age in years	Male (%)	Female (%)	Total (%)
20-29	1(4.6)	4(18.1)	5(22.7)
30-39	10(62.5%)	6(10.2)	16(72.7)
40-49	-	-	-
>60	1(4.5)	-	1(4.5)
Total (%)	12(54.5)	10(45.5)	22(100)

Out of the 22 participants of the survey, 4 were consultant surgeons with the maximum and minimum years of experience of 2 years and 13 years with mean being 5.5 years. Seven 5th year residents also participated in the survey while the participants from 4th and 3rd year of residency were 4 and 5 in number.

Table 5- Education level of survey participants

Education Level	Sex	Frequency	Percent
Consultant Surgeon	Male	3	13.6
	Female	1	4.5
Fellow Surgeon	Male	2	9.1
5th year Resident	Male	5	22.7
	Female	2	9.1
4th year Resident	Male	1	4.5
	Female	3	13.6
3rd year Resident	Male	1	4.5
	Female	4	18.1
Total		22	

Figure 2- Education level of survey participants

All the study participants believe that operation notes should have standards and the quality of the operation notes affects patient care. Follow up of patients is mentioned as most commonly affected aspect of patient care (45.5%). Planning of future interventions is also mentioned as one way that operation note affects patient care by 36.3% of the participants whereas communication with nurses and physicians was mentioned by a third of the participants (31.8%). Operation note quality is also associated with preventing future mismanagement of patients by providing information regarding the definitive diagnosis of a disease as mentioned by 18.2% of the participants.

The standards that were reported to be documented always by all the respondents include the date, name of the surgeon and assistant. The operative procedure and finding was reported to be always documented in 95.5% of the respondents each while 90.9% reported to document the operation diagnosis consistently in all notes.

Name of anesthetist, post-operative instructions and signatures were reported to be written consistently by 19 (86.4%) of the respondents while incision and details of tissue were reported to be documented consistently by 15 of the respondents (68.2%)

Half of the respondents reported to write the nature of the operation, whether elective or emergency. Twelve of the respondents reported to document the presence of any complication or extra procedures done consistently (54.5%). Time, identification of prosthetic and implant and details of closure technique were reported to be consistently stipulated by 40.9%, 31.8%, 45.5% of the survey participants. Documentation of the anticipated blood loss, antibiotic prophylaxis and venous thromboembolism prophylaxis were the least consistently written standards of the operation notes(18.2%, 36.4%,4.5% respectively)

Around 9.1 % of the participants had formal training on operation note writing. Reading other operation notes and learning by practice were other means by which participants learned how to write operation notes (81.8% and 40.9% of the participants respectively).

More than 95% of the participants believe that formal training on operation note writing standards is the best way to learn how to write operation notes, followed by learning by practice in 40.9% of participants. Reading other operation notes is also mentioned as one way of teaching operation notes by 7 of the participants (31.8%).

Five of the survey participants know a standard for operation note writing but none were mentioned.

Regarding adherence to the RCSEng standards, only 1 participant reported to comply with all the standards listed in the guideline always. More than a third responded by saying they never adhere to all the standards listed in the guideline. The most commonly attributed reasons for not complying were absence of formal teaching and incomplete operation note format, each mentioned by 18.2% of participants as the main reason.

The development of operation note standard specific to plastic and reconstructive surgery is deemed important by 16 of the 22 respondents (72.7%). The additional

standards that were deemed important to be added to the RCSEng include need for splints and drains left, previous surgery performed, pre- and post-operative preparation and follow up checklist and space for pictorial representation of surgical incisions graft donor/ recipient sites,. It is also suggested to have a separate operation sheet for major and minor operative procedures with mentioning of local anesthetic drug dose and amount. Some standards were mentioned to be not significantly relevant to patients in the unit including name of anesthetists and antibiotic prophylaxis for procedures done under local anesthesia, venous thromboembolism prophylaxis.

The most important measure for improvement of quality and completeness of the operation notes suggested by most participants is formal education (68.2%) followed by update of the operation note proforma up to the standard (27.3%). Having aide memoire in the operation theatre and clinical education of the staff were also considered to have an impact on the quality improvement operation notes (22.7% each). Regular audit and follow up of operation note standards is also mentioned as one of the measures to improve the quality of the operation notes. Typed operation formats and having electronically available proforma with a means of having photographic documentation were also suggested to improve the operation note quality with additional suggestion to have a separate operation note formats for major and minor surgeries.

- **Discussion**

The audit operation note in the plastic and reconstructive surgery unit of ALERT hospital is found to be incomplete with regards to RCSEng GSP 2014 standards which is consistent with findings seen in studies done in surgical departments worldwide,(1,3,6,10,11,13) more specifically in other plastic and reconstructive surgery departments(7,12)

In this study none of the standards in the guideline were found to have been documented 100% which is similar with findings of a study done in the UK. (7) On contrary, studies conducted in Pakistan and Malawi found some standards completed 100%. (3, 11, 12)

The documentation of time, whether elective or emergency procedure, estimated blood loss, antibiotic prophylaxis and venous thromboembolism prophylaxis were completed in less than 50% of the notes, similar to other studies done in the UK. (1)

Absence of formal training followed by incomplete operation note format are reported to be the main reasons for incompleteness of the operation note standard which is also supported by a study done in surgical departments in Menelik and Zewditu hospitals in Addis Ababa. (9) The study also identified operation notes not being written by most senior surgeon as one of the reasons for the poor quality of operation notes. In our study, less than 1% of the operation notes were written by

consultant surgeons but most of the survey participants do not believe that this to be a reason for incompleteness of the operation notes.

The standards found documented on other notes in the medical records like the anesthetic sheet and WHO surgical safety checklist were less than 50% of missing data on the operation notes, unlike findings of a study done in UK. (1)

In our survey, the some participants suggested standards like name of anesthetist for cases done under local anesthesia, venous thromboembolism prophylaxis to be not relevant standards to plastic and reconstructive surgery procedures. Most of the respondents believe that specialty specific standards of operation note should be developed which is supported by study done in another plastic and reconstructive surgery department. (7)

In our study, formal teaching is considered to be the best way to learn how to write operation notes by 95.5% of the respondents, despite less than 10% having formal training themselves. Borchert et al also had comparable finding regarding the attitudes of different level doctors towards formal teaching on operation notes, 93.7% of whom reported it to be important means of teaching. (17)

Next to formal education, having updated operation note proforma with components of the standard listed is suggested to be the best method of improvement in quality of operation notes in our survey. Standards like estimated blood loss, whether elective or emergency procedure , presence of any complication or extra procedure done are standards that showed significant improvement with this intervention in the study done referral hospital in Malawi.(3)and these are standards with great deficiency seen in our set up.

Use of aide memoire in operation theatres is another quality improvement intervention suggested by some of the respondents of our study and an intervention that showed significant improvement in different studies in the UK. (4,6)

- **Conclusion**

  The operation notes evaluated in Plastic and Reconstructive surgery department of ALERT Hospital were found to be incomplete with regards to RCSEng GSP 2014 standards. Possible causes identified for incompleteness include absence of formal education and operation note formats that do not include all the standards. Measures that were suggested by survey participants to improve the quality of operation notes include formal education to be incorporated in the education program, updating the existing operation note proforma to include the standards and any other relevant information specific to plastic and reconstructive surgery, introducing aide memoire in the operation theatres to remind anyone writing on operation notes and clinical education of the staff on operation note standards.

- **Recommendations**
    - Introduce formal education on how to write operation notes preferably as introductory course at the beginning of residency.
    - Update existing operation note proforma to include the standards.

- To post aide memoire at writing posts of operation theatres regarding operation note standards.
- To re-audit the practice after the execution of above-mentioned interventions to assess their impact.

- **Dissemination Plan**

  The research will be submitted to Addis Ababa University-Medical Faculty, Department of Surgery as requirement for completing sub-speciality training in Plastic and Reconstructive Surgery program, ALERT hospital, Ministry of Health for possible application and publication of the study.

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- **Annex**

- **Data collection guideline/ Check list**

OPERATION STANDARD	On the operation note			On Anesthetic Sheet	On WHO Surgical Safety Checklist
	Present	Absent	Not indicated		
Date of operation					
Time of operation					
Elective or Emergency Procedure					
Name of operating surgeon					
Name of assistant					
Name of Anesthetist					
Operative procedure					
Incision					
Operation Diagnosis					
Operative Finding					
Any Complications					
Any extra procedure performed and reason why performed					
Details of tissue removed, added or altered					

Identification of any prosthesis used –serial number of prosthesis, implant materials					
Details of closure technique					
Anticipated blood loss					
Antibiotic prophylaxis					
Venous Thromboembolism prophylaxis					
Detailed post-operative care instruction					
Signature					

Written by Consultant Surgeon……

Fellow Surgeon…….

R5……..

R4……..

R3…….

General Practitioner……..

- **Self-administered Questionnaire**

Dear all, this research is conducted for the purpose of completion of Plastic and Reconstructive Surgery residency in Addis Ababa University, Medical Faculty, Department of Surgery, Plastic and Reconstructive Unit regarding operation note writing. Thank you for agreeing to take the survey. All of the answers you provide in this survey will be kept confidential.

If you have any questions, please contact me at +251911435515 or e-mail - legehellina@gmail.com.

- **Demographic data**

(Please indicate your choice by putting (√) in the box.)

- Sex □ Male □Female

- Age □ 20-29 years

  □ 30-39 years

  □ 40-49 years

  □ 50-59 years

  □ Above 60 years

- Education level

  a. Resident □ R3……. □ R4…… □ R5……

  b. Fellow Surgeon…….

  c. Plastic and Reconstructive Surgeon□

  Work experience in years……

- **About Operation Note Standards**

- Do you think operation notes should have a standard? (Please indicate by putting (√) under your choice.)

  □Yes □No

- Do you think the quality of operation note writing affects patient care? Please indicate by putting (√) under your choice.)

  □Yes □No

- If yes is your answer to que. 2, how does operation note quality affect patient care?

  ……

- In what way did you learn how to write operation notes?

  □formal training

  □learnt by practice

□reading other operation notes/

Others (please state)……

- Which of these methods do you think a surgeon **should** learn how to write operation notes?(please rank from best method to least)

……formal teaching

……learnt by doing

…....reading other operation notes

Others (please specify)……

- Do you know any standard for operation note writing?

□Yes □No

- If your answer to que. 6 is yes, please specify.....

The Royal College of Surgeons of England (RCSEng) has produced a guideline in 2014, that outlines the minimum standard of documentation to be found in operation notes. The guideline is titled 'Good Surgical Practice' and includes the following standards to be written down, preferably typed.

- Date
- Time
- Elective or emergency procedure
- Name of operating surgeon and assistant
- Name of theatre anesthesiologist
- Operative procedure
- Incision
- Operative diagnosis
- Operative findings

- Any problems or complications
- Any extra procedures performed and reason why it was performed
- Details of tissue removed added or altered
- Identification of any prosthesis used including serial numbers of prosthesis and other implant materials
- Details of closure technique
- Anticipated blood loss
- Antibiotic prophylaxis
- Venous Thromboembolism prophylaxis
- Detailed post-operative care instructions
- Signature

- How often do you write **ALL** the above mentioned standards on operation notes?

  □Always

  □Usually

  □Often

  □Never

- If your answer to que. 8 is not ‘always’, what is the reason for not documenting all the standards?(please rank from most important reason to least)

  □absence of formal teaching

  □operation note format incompleteness

  □information written in other parts of the medical record (like anesthetic chart, World Health Organization Surgical Safety Checklist etc.)

  □operation note not written by the most senior surgeon

□omitting parts of the standards found not relevant

Others (please specify)……

- Which one of the standards do you **ALWAYS** document?(please mark √ in front of your choice)

  □Date

  □Time

  □Elective or emergency procedure

  □Name of operating surgeon and assistant

  □Name of theatre anesthesiologist

  □Operative procedure

  □Incision

  □Operative diagnosis

  □Operative findings

  □Any problems or complications

  □Any extra procedures performed and reason why it was performed

  □Details of tissue removed added or altered

  □Identification of any prosthesis used including serial numbers of prosthesis and other implant materials

  □Details of closure technique

  □Anticipated blood loss

  □Antibiotic prophylaxis

  □Venous Thromboembolism prophylaxis

□Detailed post-operative care instructions

□Signature

- Do you think operation note standard specific to plastic and reconstructive surgery should be developed?

  □Yes □No

- If yes to que. 11, please indicate any standard that you think is relevant to plastic and reconstructive surgery to **add** to the RCSEng standards?

  ……

- If yes to que.11, please indicate any standard that you think is **not relevant** to plastic and reconstructive surgery from the RCSEng standards?

  .....

- In your opinion, what measures would improve the quality of operation note standards?

  .....

- Please rank these measures of improvement **(from most important to least)** for the quality and completeness of operation notes

  □Formal education

  □Learn by doing

  □Aide memoire in operation rooms

  □Updating the existing operation note proforma

  □Clinical education to staff members

  □Regular audit of operation notes

  □Typed operation notes

  □Electronically available proforma

  □Photographic documentation