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A Noteworthy Issue: The quality of handwritten surgical operative notes from surgical trainees.

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Abstract:

Introduction

Surgical operation notes are crucial for medical record keeping and information flow in continued patient care. In addition to inherent medical implications, the quality of operative notes also has important economic and medico-legal ramifications. Further, well documented records can also be useful for audit purposes and propagation of research, facilitating the improvement of delivery of care to patients. We aimed to assess the quality of surgical operation notes written by junior doctors and trainees against a set standard, to ascertain whether these standards were met.

Method:

We undertook an audit of Urology and General Surgery operation notes handwritten by junior doctors and surgical trainees in a tertiary teaching hospital over a month period both in 2014 and 2015. Individual operative notes were assessed for quality based on parameters described by the Royal College of Surgeons of England (RCSE) guidelines.

Results:

Based on the RCSE guidelines, a significant proportion of analysed surgical operative notes were incomplete, with information pertaining to the time of surgery, name of anaesthetist and DVT prophylaxis in particular being recorded less than 50% of the time (22.42%, 36.36% and 43.03% respectively). Overall, 80% compliance was achieved in 14/20 standards and 100% compliance was attained in only 1 standard.

Conclusions:

The quality of surgical operation notes written by junior doctors and trainees demonstrated significant deficiencies when compared against a set standard. There is a clear need to educate junior medical staff and to provide systems and ongoing education to improve quality. This would involve leadership from senior staff, ongoing audit and the development of systems that are part of the normal workflow to improve quality and compliance.

Introduction & Objectives:

Surgical operation notes are an important form of medical record keeping. This document is essential for the immediate and long-term care of the patient. Aside from the more obvious medical implications, the quality of these notes also has economic and medico-legal ramifications¹. Additionally, well-kept records can also be utilised in internal audits and quality improvements as well as sustaining retrospective research projects that may improve the future delivery of care to patients².

We hypothesized that the quality of handwritten notes by current junior doctors and surgical trainees are below an acceptable standard and that there is need for more standardized teaching in this regard. Thus, we aimed to assess the quality of surgical operation notes written by junior doctors and trainees in a single tertiary institution, against a well established set standard^{3,4}.

Method:

An audit of Urology and General Surgery operation notes handwritten by junior doctors and surgical trainees in a tertiary teaching hospital in Melbourne over a similar month-long period in 2014 and 2015 was assessed for quality based on parameters described by the Royal College of Surgeons of England (RCSE) guidelines^{3,4}. These guidelines state that operation notes should include “standard attributes” as per Good Surgical Practice the following:

- Date and time
- Names of the operating surgeon and assistant
- Name of the theatre anaesthetist
- The operative procedure carried out
- Incision
- Operation diagnosis
- The operative findings
- Any problems/complications
- Details of tissue removed, added or altered
- Details of closure
- Estimated blood loss
- Antibiotic prophylaxis
- DVT prophylaxis
- Postoperative care instructions
- Signature

RCSE guidelines on this subject were first developed in 1990 and have been modified multiple times over the years. To the best of our knowledge similar guidelines on operations notes are not available in Australia and thus we compare the performance of our study against the established English guidelines.

The operative notes were retrospectively reviewed for completeness by two independent observers commenting on the presence or absence of information on date, time, emergency/ elective procedure, names of surgeon and assistant, operative diagnosis, operative procedure, incision, position, type of anesthetic, antibiotics, DVT prophylaxis, findings, problems/ complications, tissue removed/ added/ altered, haemostasis, blood loss, details of closure, signature, post operative instructions, author and the use of the abbreviation "RPAO" (Routine Post Anaesthetic Observation). For urological procedures we assessed common procedures at our institution including: circumcision, cystolithopaxy, orchidectomy, orchidopexy, nephrectomy, prostatectomy, TURBT, TURP, insertion of suprapubic catheter and ureteric laser and or stenting procedures. For general surgical procedures, we assessed the operative reports for laparoscopic cholecystectomy, inguinal hernia repair and other hernia repair surgery. We excluded all reports written by surgical fellows and consultants, due to inadequate numbers for adequate statistical comparison. Discrepancies were resolved between the two observers when present and common consensus was achieved for all notes assessed.

Results:

A total of 164 operation reports (84 urological and 80 in general surgical procedures) were analyzed. A significant proportion of operative notes were incomplete, with information pertaining to the time of surgery, name of anaesthetist, position and DVT

prophylaxis in particular being recorded less than 51% of the time (22.42%, 43.03%, 50.9 and 36.36% respectively). Overall, 80% compliance was achieved in 14/20 standard attributes and 100% compliance was attained in only 1 standard attribute.

Of the two surgical specialties analyzed, it was found that urological operative notes were more incomplete than general surgery notes. As shown in Table 1, the five standard attributes most poorly documented in urology notes were information on venous thrombosis prophylaxis where applicable (0%), time of procedure (2.35%), name of anaesthetist (14.1%), whether the procedure was elective or emergency (32.9%) and the surgical position of the patient during the procedure (34.11%). Urology operative notes had an 80% compliance rate in 14/20 standards and 100% compliance was recorded in 4 categories (surgeon's name, operative diagnosis, procedure and signature).

General surgery notes were more complete in comparison to urological notes. Time of procedure (43.75%) and haemostasis (48.75%) were the only two categories recorded less than 50% of the time. 80% compliance was reached in 15/20 standards and 100% compliance was reached in 5 categories (date, surgeon's name, complications, tissue removed/ added/ altered and details of closure).

In regards to comparisons between the two surgical specialities, there were significant similarities between the two groups in regards to which attributes were documented consistently. As can be seen in Table 1, apart from elective/emergency procedure (92.5% in general surgery group vs 32.9% in urology group), all of the attributes recorded greater than 80% of the time by the general surgical group were also documented greater than 80% of the time by the urology group. Similarly, there was widespread use of the abbreviation "RPAO" in both urology and general surgery (77.64% and 70% respectively).

Experience level of the trainees and degree of completeness was also assessed. We divided the trainees into 3 groups: pre-SET (Surgical Education and Training), SET level 1 – 3 and SET level 4 – 6. The pre-SET group achieved less than 50% compliance in only 2 standards (time at 47.72% and haemostasis at 44.18%). The use of "RPAO" was used 84.09% of the time. In this group, 80% compliance was achieved in 16/20 standards and 100% compliance attained in 10 standards. The SET level 1-3 group achieved less than 50% compliance in 5 standards (time at 6.67%, elective/emergency procedure at 40%, name of anaesthetist at 33.33%, position at 42.2% and DVT prophylaxis at 20%). This group used "RPAO" 93.33% of the time. 80% compliance was achieved in 16/20 standards and 100% compliance was attained in 8 standards. With respect to the SET level 4-6 group, there was less than 50% compliance in 4 standards. (time at 17.33%,

name of anaesthetist at 30.67%, position at 45.3% and DVT prophylaxis at 26.67%). This group used “RPAO” 57.33% of the time. 80% compliance was achieved in 14/20 standards and 100% compliance was attained in 3 standards.

Discussion

The importance of clear, concise and accurate operative reports has been well-established to improve patient flow and overall patient care. The results of the current study demonstrate that significant improvements are required to satisfy industry and professional standards. Our data addresses a breadth of operation type across the fields of Urology and General Surgery.

Results of the current study demonstrate improved compliance of the operative reports by more-junior surgical staff, as demonstrated in Table 2. Specifically, the pre-SET group had the best compliance overall when compared to the SET level trainees. This may be due to greater consultant supervision in the junior group. Furthermore, more experienced trainees may place little importance in certain attributes of the operation note over time, while placing an increased importance in emphasizing specific details in the respective procedure. Nonetheless, trainees need to be aware of the expected standards to help improve compliance to 100% in all standards. Our data suggests that the importance of accurate note keeping is not emphasized enough in current surgical training. This is not

an isolated finding, given the recurring theme of incomplete surgical operation notes as documented in the literature^{5,6}. Johari et al also showed deficiencies in surgical operation notes in their study which compared the quality on the notes before and after teaching of residents about writing operation notes. Teaching significantly improved the quality of the operation notes with some standards registering between 30 to 58.4% improvement which highlights the importance of educating trainees in respect to this tasks⁵.

The authors of this study believe that there is a potential need for a shift to electronic operation notes to improve legibility. Increased legibility will facilitate easier completion of future audits and retrospective research, aid non-medical investigators when documentation is used for medico-legal reasons (e.g. as defense in court cases) and also to improve funding for hospitals by automatic coding^{7,8}. Additionally, the use of prompts including drop-down selection in electronic operation notes can encourage completeness^{9,10} as they serve as timely reminders for commonly omitted information, especially in those fields found to be deficient in our study. Indeed, synoptic reports have been associated with more reliable and complete reports¹¹. Such improvement in quality of medical records in addition to the subsequent improvement in patient care has seen a shift from handwritten to electronic discharge summaries in many institutions¹⁰. Additional benefits such as the creation and collation of real time prospective databases that are integrated with mandatory electronic notes fields are

possible and may propagate a new age of data collection and research. However, inherent difficulties with patient confidentiality and ethics may prevent this from becoming standard practice. Dukic et al have described the use of a software program that can be used to create customized specialty specific operation templates and is also used for surgical waitlists, postoperative care and audit¹². Records of typed operative notes go as far back as 1905 in a glaucoma case performed by Harvey Cushing and yet over 120 years later we still have not progressed to electronic notes as standard practice¹³. Encouragingly, an increasing number of Australian hospitals are now utilizing paperless systems for medical records including electronic operation notes and an example of such a centre is the Peter MacCallum Cancer Centre in Victoria. Since conducting this study, our institution has also transitioned to electronic operation notes and a future audit comparing the quality of electronic operation notes against the results of this study would certainly be of interest.

Specifically for surgical notes, clear post operative instructions also allow specific reference points for health providers in hand over of care. The WHO safer surgery checklist (2009) stresses the importance of patient safety and this requires clear, timely and tamper-proof operation notes¹⁴. The use of the abbreviations such as "RPAO" can confuse and needlessly complicate precise surgical messages and post operative plans (especially for junior staff) and should be avoided entirely.

There are some limitations to the current study. This was a single centre, retrospective audit done over a randomly selected month period in two consecutive years. This can be prone to selection bias and may not necessarily apply to the whole of Australia. In this series, there was also no data comparing the performance of consultants and this would be worth assessing in future studies. Given that in most teaching hospitals the operation notes are written by the registrars, it may be difficult to accumulate enough numbers on consultant written notes, however comparison with private hospital data where the operation notes are written by the treating surgeon could help answer this question.

Conclusion

Clear and complete operative notes have benefits in multiple arenas. The quality of surgical operation notes written by junior doctors and trainees has been shown to demonstrate significant deficiencies when compared against a set standard. There is a clear need to educate junior medical staff and to provide systems and ongoing education to improve quality. This would involve leadership from senior staff, ongoing audit and the development of systems that are part of the normal work flow to improve quality and compliance.

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Tables:

Table 1 Completeness of Urology and General Surgery operation notes handwritten by junior doctors and trainees

Parameter	Urology	General Surgery	Overall
Date	84 (98.8%)	80 (100%)	164 (99.39%)
Time	2 (2.35%)	35 (43.75%)	37 (22.42%)
Elective/Emergency procedure	28 (32.9%)	74 (92.5%)	102 (61.81%)
Names of surgeon and assistant	84 (100%)	80 (100%)	165 (100%)
Name of anaesthetist	12 (14.1%)	59 (73.75%)	71 (43.03%)
Operative Diagnosis	84 (100%)	78 (97.5%)	162 (98.78%)
Operative procedure	84 (100%)	79 (98.75%)	163 (99.39%)
Incision	29/33 (87.87%)	74 (92.5%)	103/113 (91.11%)
Position	29 (34.11%)	55 (68.75%)	84 (50.9%)
Type of anaesthetic	72 (84.7%)	65 (81.25%)	137 (83.03%)
Antibiotics	77 (90.58%)	78 (97.5%)	155 (93.93%)
DVT prophylaxis	0 (0%)	60 (75%)	60 (36.36%)
Findings	82 (97.64%)	79 (98.75%)	161 (98.17%)
Complications	83 (98.82%)	80 (100%)	163 (99.39%)
Tissue removed/added/altered	66/69 (95.65%)	80 (100%)	146/149 (97.98%)
Haemostasis	48/65(73.84%)	39 (48.75%)	87/145 (60%)
Details of closure	29/35 (82.85%)	80 (100%)	109/115 (94.78%)
Signature	84 (100%)	79 (98.75%)	163 (99.39%)
Post operative instructions	83 (98.82%)	75 (93.75%)	158 (96.34%)
Author	78 (91.76%)	79 (98.75%)	157 (95.15%)
Use of "RPAO"	66 (77.64%)	56 (70%)	122 (73.93%)

Table 2: Completeness of Urology and General Surgery operation notes handwritten by junior doctors and trainees based on level of training of author.

Parameter	Non SET	SET 1- 3	SET 4 – 6
Date	44 (100%)	45 (100%)	75 (100%)
Time	21 (47.72%)	3 (6.67%)	13 (17.33%)
Elective/Emergency procedure	43 (97.72%)	18 (40%)	41 (54.67%)
Names of surgeon and assistant	44 (100%)	45(100%)	75 (100%)
Name of anaesthetist	33 (75%)	15 (33.33%)	23 (30.67%)
Operative Diagnosis	44 (100%)	45 (100%)	73 (97.33%)
Operative procedure	44 (100%)	45 (100%)	75 (100%)
Incision	41/43 (95.3%)	17/21 (80.95%)	45/49 (91.84%)
Position	31 (70.45%)	19 (42.2%)	34 (45.3%)
Type of anaesthetic	36 (81.81%)	37 (82.2%)	64 (85.3%)
Antibiotics	42 (95.45%)	44 (97.77%)	69 (92%)
DVT prophylaxis	31 (70.45%)	9 (20%)	20 (26.67%)
Findings	44 (100%)	43 (95.55%)	74 (98.67%)
Complications	44 (100%)	45 (100%)	74 (98.67%)
Tissue removed/added/altered	43/43 (100%)	39/41 (95.12%)	64/65 (98.46%)
Haemostasis	19/43 (44.18%)	33/41 (80.49%)	35/61 (57.38%)
Details of closure	43/43 (100%)	21/22 (95.45%)	45/50 (90%)
Signature	44 (100%)	45 (100%)	74 (98.67%)
Post operative instructions	44 (100%)	45 (100%)	70 (93.33%)
Author	43 (97.73%)	45 (100%)	70 (93.33%)
Use of "RPAO"	37 (84.09%)	42 (93.33%)	43 (57.33%)