

Orthopedic Operation Notes: What are we Missing?

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Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

Article Information

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- Complete Peer review History: <http://www.sdiarticle4.com/review-history/66736>

Original Research Article

Received 02 February 2021

Accepted 08 April 2021

Published 01 May 2021

ABSTRACT

Background: Accurate legible documentation of operation notes is core element of surgical practice in any Specialty. Complete comprehensive operation notes are also important for maintaining high standard of patient care and for defense in medico legal cases.

Aims: Objective of our study was to compare the quality of orthopedic trauma operation notes at our hospital with standard set by the Royal college of Surgeons , England (RCSE) 2008.

Materials and Methods: Retrospective review of 300 Orthopedic trauma surgery notes was carried out for the period 01/1/2017 to 31/12/2017. Additional variables not included in RCSE 2008 guidelines were included in results. The complete data collected was analyzed using SPCC 20 version.

Results: The demographic details as well as date, time of surgery, name of surgeon, assistant surgeon, anesthetist, scrub nurse and signature were documented well in nearly all cases. Notes were written by the lead surgeon in 80.6 % cases and 0.5% were consultant notes. Adequate document were; Implant usage in 62.5%, Postoperative instructions 96.6%, Intra operative complications, blood loss, ICD -10 coding were poorly documented while tourniquet time was not documented well.

Conclusion: Our study highlighted major deficiencies in some areas with good compliance in other areas. Therefore we suggest to use aide memoire and standard based Performa's which will improve quality of operation notes and better follow up patient care.

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Keywords: Medico legal cases; surgical notes; orthopedic trauma surgery; blood loss.

1. INTRODUCTION

A high standard of medical record keeping is important for safe care of patients. Comprehensive, documentation of surgical operation notes is an essential part of any surgery as it contains details of all relevant operation findings, postoperative plans to facilitate post operative management of the patients . They are important for medical cost billing, quality assurance, education, research purposes and medico-legal issues. The importance of good note keeping is recognized by the General Medical Council (GMC) which states that good note keeping is an essential part of good medical practice [1].

The Royal college of surgeons of England (RCSE) in keeping with this published the booklet:

"*Good surgical Practice*" which contains recommendation for documentation of complete operation notes [2]. The British orthopedic association (BOA) also states that "good record keeping is as basic tools of clinical practice "[3]. There is no consensus among surgical disciplines on the required standard operative notes. The Royal college of surgeons of England (RCSE) published guidelines on the operative notes documentation are widely accepted in the United Kingdom and supported by the British Orthopedic association.

There has been increasing litigation rates in orthopedics being only second to obstetrics and gynecology worldwide the same trend is emerging in this part of globe. This fact is also highlighted by the National Confidential Enquiry into Per operative deaths in U.K.[4] which labeled orthopedic operation notes as " untidy one liners" due to poor incomplete , inadequate operation documentation and inappropriate abbreviation use . As stated elsewhere the yearly increase in orthopedic litigation of 16% between 2010 -2011 and 2011 -2012 compared to the 6% increase in the NHS is note worthy.

In our hospital computerized electronic Surgical note keeping saved in the Hospital Information management system (HIMS) software is the practice as hand written notes were often found illegible, could be lost or misplaced over period of time .

The aim of this audit was to assess the completeness of our Orthopedic surgery

operative notes and:

- Evaluate its completeness with respect to the RCSE 2008 guidelines
- Highlight the essential information found lacking in the notes
- Develop an electronic operation note templates for common orthopedic procedures
- Link the ICD-10 diagnosis codes, co morbidities and operation codes thereby promoting integrated sustainable comprehensive electronic notes that are easily accessible for nurses, physiotherapy staff to achieve optimal postoperative rehabilitation of patient care and follow up in the outpatient clinic .

2. MATERIALS AND METHODS

The study was conducted by retrospective review of 300 orthopedic trauma surgery operation notes with respect to RCSE 2008 guidelines (Table 1) over a period twelve months from 01/1/2017 to 31/12/2017 .Additional variables not included in RCSE guidelines 2008 (Table 2) were also analyzed in the results. The study sample included both adult and pediatric patients admitted in our hospital. The information about surgery notes was extracted from Hospital Information management system (HIMS) and recorded on prepared data Performasheet.

Inclusion Criteria:

- All orthopedic trauma patients admitted in our hospital for major elective or emergency surgery.

Exclusion Criteria:

- Patients who underwent intermediate or minor orthopedic surgery such as closed reductions under anaesthesia , Excision of ganglion , K - wire removal etc.
- Poly trauma patients with multiple injuries
- Soft tissue surgery where no implant was used.
- Local intra articular or intra tendinous injections

- Revision orthopedic surgery cases
- Where operation notes data could not be retrieved or was incomplete

2.1 Data Analysis

The data derived was compared to RCSE 2008 operation notes guidelines on data sheet

in coding manner for each variable: Present, absent and not applicable (NA). The percentage of all variable codes with mean was calculated. The data was analyzed using Statistical Package for social sciences (SPSS) version 20. The final outcome was assessed by recording the number of variables missing from RCSE 2008 set guidelines plus additional variables not included in RCSE 2008 guidelines (Table 1-2).

3. RESULTS

The study compared a total of three hundred (300) orthopedic trauma operation notes which comprised 210 adult and 90 pediatric, upper and lower limb surgery notes. All operation notes were legible as we used electronic system for entering patient notes. Only 203 (67.7%) of all notes met all the set RCSE 2008 guidelines. The missing variables were 1-5, 6-12 and 13-18 in 15

(0.5%), 36 (12%), 46 (15.3%) respectively (Table 1).

Operation notes written by Surgeon were 242(80.6%) while those of the Assistant Surgeon were 58(19.4%). Only 15 (0.5%) notes were written by the Consultants, 273(91%) by the specialist grade surgeons and 12(0.4%) by the medical officers. The signatures were present in all notes, as by default the surgeon entering the notes on logging in the HIMS is automatically saved by computer. Additional 19-23 variables found to be missing in 14(4.7%) patients and in 286(95.3%) variable 24-27 were missing (Table 2).

Majority of patients were adult males 186 (62%), females 58 (19.4%) and children 56 (18.6%).

3.1 Pre operative Details

Final diagnosis was not revised based on intra operative findings in 217 (72.4%) cases. There was inadequate ICD-10 coding in 98.2% of

operation case notes reviewed. Consent forms were completed in all cases. Consents in 241(80.4%) cases were obtained by non operating surgeons and in 59 (19.6%) cases by the operating surgeon.

There was no documentation in 197 (32.3%) of the elective or emergency operations cases. Tourniquet was used in 92 (30.6%) cases with poor documentation of pressure, start, end time of tourniquet in all cases.

The implants used were inadequately documented in 188(62.6%) cases.

Blood loss estimates were missing in all operation notes.

Intra operative complication rate was documented adequately in 290 (96.6%) cases.

4. DISCUSSION

This is a novel sub regional audit study carried out at the Nizwa Hospital Regional referral trauma centre, Oman which serves as a medical outlet for a large population. The availability of a legible and accurately documented operation notes is essential for rendition of Medicare and basis for auditing in a resource challenge environment. Secondly it provides reliable easily accessible communication platform for healthcare professionals and medico legal concerns. There is no perfect operation notes model which vacuum the RCSE guidelines [2] readily fits in, has been widely accepted as ideal reference guideline for operation notes documentation. Our study and findings provide us with good insight of orthopedic trauma operations and Surgeons documentation of operation notes.

Most of the Surgeons notes documented well the technical aspects but lacked documentation of secondary details where only 67.7% notes were completed as per RCSE guidelines while 98% of the notes of the additional variables were found missing.

This study highlighted important missing points in our practice as compared to other studies also [3,5-9]. Various reasons advanced included poor compliance with guidelines as a result of absent formal training in documentation of operation notes. Secondly, time constraint in operation theatre forcing suboptimal notes documentation.

Acquisition of patients bio data in form of Patients' name, age, gender and hospital registration number were documented electronically in all cases and stored routinely in HIMS at variance to other studies [6,9,10,11] in which cases the variables were lacking in 32-54% cases.

There are good chances of misplacement or loss of hand written operation notes documentation as a result of non diligent patients documentation. In this study, the good documentation of 95% and 5% compliance of date and timing of surgery and start and endtime of surgery of surgery respectivel correlates well with other studies [3,6,9,10].

In our study 80.6% (n =242) cases operation notes were written by operating surgeon and in 19.4% (n=58) by assistant in contrast to other studies [9,12,13,10] where 90-100% operation notes were written by operating surgeons Only15(0.5%) notes were written by Consultant. Operation notes written by senior surgeons were found to be more elaborate and detailed compared to those written by junior surgeons [3,14].

This study recording of the anesthetist and scrub nurse names in all our cases correlates well with other studies [14,15] but at variance with Hamza et al. [9] 13.9% and scrub nurse in 0.9% cases only.

The provisional diagnosis recorded in our cases and intra operative finding based diagnosis of 72.4% cases is similar to other studies [9,15] where it was missing to the tune of 77% to 100% respectively .Other studies [6,11] only in

10-15 percentage of cases it was missing.

Correct ICD-10 coding is of medico legal importance in negligent law suit and claim payment delay [2,16]. In our study ICD-10 coding was seen in 98.2% of operation case notes reviewed. There is no clear documentation of type of surgical procedure elective or emergency in 32.6% (98) cases which is reflected in other studies also where it varies from 1 to 97% [3,9,10,11,15]. Although the type of surgery can be checked from theatre registry and documentation of type of surgery can be improved by introduction of Aide Memoire and surgeon education [8,17].

The type of anesthesia, drugs used and any adverse events and complications as recorded in this study were documented well in 92% cases is at variance to other studies 68%{11}, 80.6% [10] but correlates well with 94% in [9] casesrespectively.

Consent forms were completed in all cases, 80.4% obtained by non operating doctor in consonance but higher than 53% obtained in other studies [18]. Insufficiently filled consent forms by junior doctors, non operating surgeons risks the validity of consent and may not offer full protection to the doctors in face of litigation in thecourt of law.

Patients positioning during surgery was documented properly in 73% cases which is higher than study in UK by SARCO [19]. There was poor documentation of draping in 81% cases with no mention of solution used for skin preparation in 74% cases which is similar to reports by other authors [20].

Table 1. RCSE 2008 Parameters

-
- 1.Patient Name
 - 2.Date of Birth
 - 3.Hospital number
 - 4.Date of operation
 - 5.Time of operation
 - 6.Elective /Emergency Procedure
 - 7.Name of Surgeon
 - 8.Name of assistant
 - 9.Name of operation
 - 10.Incision
 - 11.Operative findings
 - 12 Intra operative complications
 13. Any extra procedure performed and reason
 - 14 Details of tissue removed, added or altered

- 15. Identification of prosthesis or materials used
- 16. Details of closure technique
- 17. Post-operative care instructions
- 18. Signature of surgeon

Table 2. Additional variables not included in the RCSE guidelines

- 19. Age and gender
- 20. ICD – coding
- 21. Final Diagnosis
- 22. Indication for operation
- 23. Consent Obtained by Operating surgeons
- 24. Prophylactic antibiotics
- 25. Preparation: Positioning, Skin preparation
- 26. Type of irrigation
- 27. Tourniquet time
- 28. Estimated blood loss

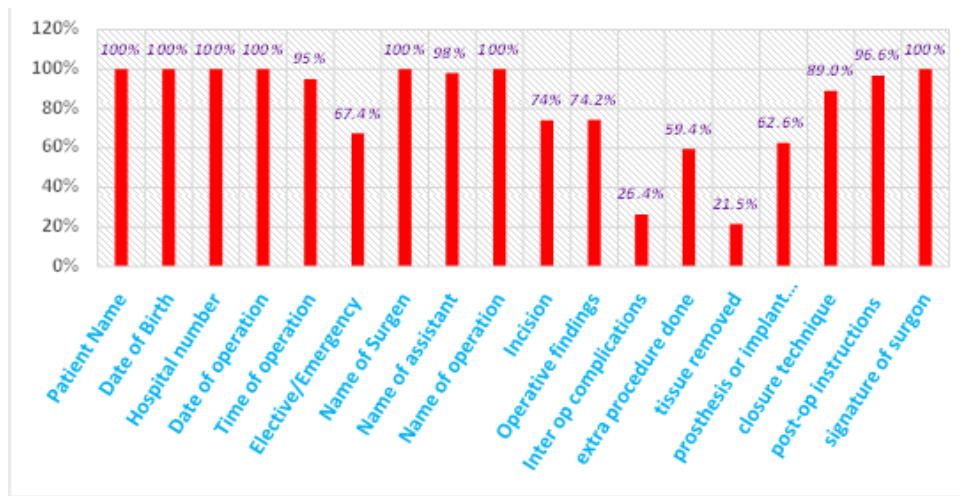


Fig. 1. RCSE 2008 guideline parameters

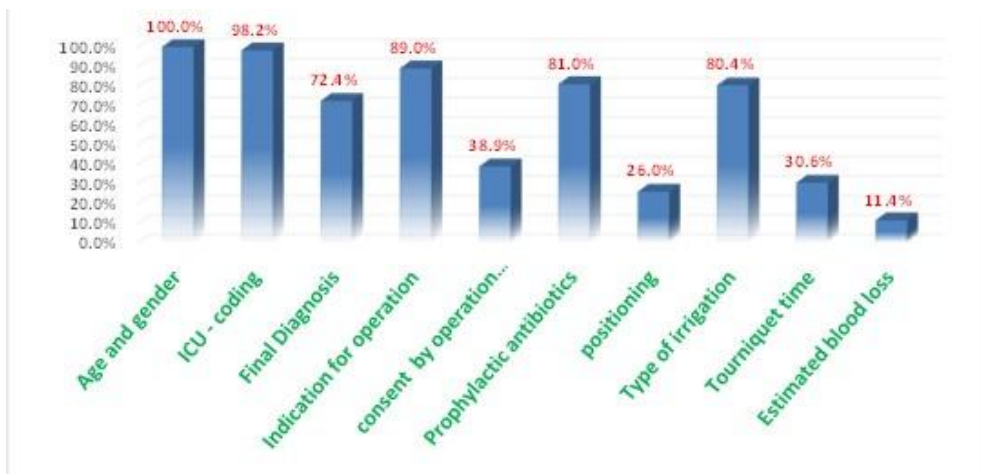


Fig. 2. Variables not included in RCSE guidelines

The prophylactic use of intra procedural antibiotic was recorded in 81.6% cases in our study is comparable to other studies [3,21,22]

Inconsistency and lack of antibiotic dosage documentation was found in many cases and neither any mention was made of repeat antibiotic used for prolonged surgery.

Tourniquet use was recorded in 30.6% cases but the record was silent on timing and pressure applied. Similar findings were found in other studies [8,21,22].

Surgical approach and incision type were specified in 74% cases is comparable to the 60.8% [6], 80.1% [21] in other studies. Operative findings were documented in only 74.2% cases in our study compared to other studies in the literature where operative findings were missing in 57.5% [6], 56%[23] and 80.1% [21].

Operative complications were not recorded in 26.4% cases which is similar to other studies where poor documentation in detailing complications was found [7,9,23,21,24], but far higher than 2.5% of Kawa et al [6].

Documentation of any extra surgical procedures performed was not recorded in 40.6% and any tissues removed during surgery was not documented in 78.5% cases which compared favorably with those of other author [6,9,11,15,22,24].

This study 62.6% recorded usage of Implants and prosthesis is higher than the 30% in other studies attributable resultant of poor documentation [8,19,21,22].

Type of fluid and irrigation used was documented in 80.4% cases, details of surgical wound closure was documented in 89% with incomplete details of suture material used in 96.4% are consistent with other studies [3,6,7,9,13,10].

There was poor documentation of intra operative blood loss in 88.6% comparable to other studies [20,24,25].

Majority of orthopedic trauma surgery is done under fluoroscopy but the radiation exposure

time and number of exposure shots were documented.

The post operative instructions were written in 96.6% cases than the reported lower percentage in other studies [3,6,9,10,11].

In our study, the post operative rounds were led by senior doctor in 84.2% cases in contrast to Rowland's et al [26] reported less percentage of post operative rounds by senior doctors at Consultant level.

In Summary there is no perfect model for faultless operation notes documentation in different surgical specialties however strategies can be adopted by different institutions for improving operation notes writing but since the basic guidelines remain the same .

Improvement in documentation of operation notes can be further enhanced by

- Provision of operation note Performa's or Aide memoire for better documentation of notes [as earlier noted by other authors 9,27,17,24]
- Introduction of electronic smart note templates with previously highlighted advantages elsewhere in this write up [27,10]
- Hand written notes were not admissible in the court of law in medico legal cases [5,28,13]
- Implementation of training and retraining program in structured training in operation note documentation to new and old staff members is sine qua non to reduction or total elimination gaps in documentation.
- Frequent supervision of junior surgeons by senior surgeons in operation note documentation .
- Avoidance of abbreviations in note keeping and in diagnosis.

5. LIMITATIONS OF STUDY

- It is a retrospective study done in one hospital by single operator moreover Hawthorne effect cannot be excluded .
- Many variables obtained from patients file through Hospital computerized data ,thereby limiting the number, quality, and completeness of variables that can be obtained in some cases.

6. CONCLUSION

Our study identified both areas of poor documentation in certain areas as well as positive elements in other areas as compared to RCSE 2008 guidelines. Also areas where we need improvement were identified and can be improved and monitored by periodic auditing.

The adoption of operative note Performa as contained in the RCS guidelines will ensure global best medical practice.

Formal inclusion of operative note writing in the curriculum at early stage of surgical training will in the long run improve documentation and patient care.

CONSENT

It's not applicable.

ETHICAL APPROVAL

It's not applicable.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
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