

Original Research Article

Orthopedic operation notes :What are we Missing .

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.

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.

Material 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 along with 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 lead surgeon in 80.6 % cases although consultant notes were found in 0.5% cases only Implants used were documented adequately in 62.6% cases. Tourniquet time was not documented well. Postoperative instructions were documented well in 96.6% cases .Intra operative complications ,blood loss, ICD -10 coding were poorly documented.

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.

Introduction

A high standard of medical record keeping is important for Safe care of patients .Comprehensive, accurate documentation of surgical operation notes is the most important part of any surgery as it contains details of all relevant operation findings and postoperative plans which facilitate which facilitate further post operative management of the patients . Surgical operative notes are important for medical cost billing, quality assurance, medical education, research purposes and medico-legal issues.The importance of good note keeping is recognized by GMC (General Medical Council)who state that good note keeping is an essential part of good medical practice [1] .The Royal college of surgeons of England (RCS) in keeping with this published the booklet. *Good surgical Practice* which contains recommendation for documentation of complete operation notes [2]. The BOA (British orthopedic association) also states "good record keeping as basic tools of clinical practice "[3]. There is no consensus among surgical disciples 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 Orthopaedic Association.

There has been increasing litigation rates in orthopedics being only second to obstetrics and Gynecology worldwide and we have seen the same trend emerging in this part of globe .The fact is also highlighted by National Confidential Enquiry into Per operative deaths in U.K.[4] where orthopedic operation notes were labeled on “ untidy one liners” due to poor incomplete , inadequate operation documentation and in appropriate abbreviation use .It is worthwhile to note the rising trend of litigation in orthopedic surgeries which is increasing on a year on year basis in the NHS with a 16% increase between 2010/2011 and 2011/2012 compared to only 6% increase in claim volume for the NHS as a whole. [5].

In our hospital we have been using the typed computerized electronic Surgical note keeping which is saved in the Hospital Information management system(HIMS) software as hand written notes were found often not legible and could be lost or misplaced over period of time .

The aim of this audit was to assess the completeness of our Orthopaedic surgery operative notes and

- Evaluate the completeness of operative notes with respect to the RCSE 2008 guidelines
- Highlight the essential information that was found lacking in the operative 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 which are easily accessible for nurses, physiotherapy staff in order to achieve optimal postoperative rehabilitation for continuation of patient care and follow up in outpatient clinic on subsequent visits.

Material and Methods :

The study was conducted by retrospective review of 300 orthopedic trauma surgery operation notes with respect to RCSE 2008 guidelines over a period 01/1/2017 to 31/12/2017 .Additional variables not included in RCSE guidelines 2008 were also analyzed in results. The study sample included both adult and pediatric patients admitted in our hospital who underwent orthopedic trauma surgery .The information about surgery notes was extracted from Hospital Information management system(HIMS) and recorded on prepared data performa sheet .Informed consent was not required in our study as it was retrospective review of already stored data in HIMS with no patient contact required. However patient confidentiality was maintained and each patients data was assigned a number .All of the notes were reviewed by single reviewer.

Inclusion Criteria :

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

Exclusion Criteria :

- Patients who underwent Intermediate or minor orthopedic surgery for example closed reductions under anaesthesia , Excision of ganglion , K wire removal etc.
- Polytrauma patients with multiple trauma injuries .
- Soft tissue surgery where no implant was used.
- Local intrarticular or intratendinous injections
- Revision orthopedic surgery cases
- Where operation notes data could not be retrieved or was incomplete

Data Analysis :

The data derived was compared to RCSE 2008 operation notes guidelines on data sheet in coding manner for each variable: Present (1), Absent (2) and NA (Not applicable) .At the end percentage of all variable codes along with mean percentage 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) .

Results:

The study compared total 300 orthopedic trauma operation notes which comprised of 210 adult and 90 pediatric upper and lower limb surgery notes.All operation notes were legible as we have electronic system for entering patient notes. Out of 300 operation notes only 203(67.7%) of all notes met all the set RCSE 2008 guidelines. In 15(0.5%) patients variable between 1-5 , in 36(12%) 6-12 variable and in 46(15.3%) between 13-18 variable of RCSE 2008 guideline were missing .(Table 1) .

The proportion of operation notes written by Surgeon were 242(80.6%) and rest 58(19.4%) were written by assistant.Only15(0.5%) notes were written by Consultant.In majority of cases (273 / 91%) the specialist grade surgeons had documented the notes were as in only 12(0.4%) cases medical officer had written the operation notes. The signature were present in all notes as by default the surgeon entering the notes on logging in the HIMS the name is automatically saved by computer. Additional 19-23 variables found to be missing in 14(4.7%) patients and in 286(95.3%) variable2 4-27 were missing (Table 2) .

Majority of patients were adult males 186 (62%) followed by females 58 (19.4%) and children 56 (18.6%) (Fig1). The mean age of patients was 29.6 years.

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 but in 241 (80.4%) cases were obtained by non operating surgeons and only in 59 (19.6%) cases were obtained by the operating surgeon. In 97 (32.3%) cases there was no documentation of elective or emergency operations. Tourniquet was used in 92 (30.6%) cases but in all cases there was poor documentation of pressure, start end time of tourniquet.

The implants used were documented inadequately in 188 (62.6%) cases. Blood loss estimates were missing in all operation notes. Intraoperative complication rate was documented adequately in 290 (96.6%) cases.

Discussion :

This audit study probably the first of its kind in this part of world is from a Nizwa Hospital Regional referral trauma centre, Oman which caters to large population. Complete legible accurate documentation of operation notes are important for delivery and continuation of patient care which serves as one of the basics for auditing the delivery of health care in present resource challenged environment. Secondly it forms important bridge for communication between healthcare professionals and is important legal document for any further medico legal suites. There is no perfect model for faultless operation notes. The RCSE guidelines [2] has been widely accepted and followed over years as ideal reference guideline for operation notes documentation. Our study and findings provide us with good insight about the range of orthopedic trauma operations and vivid experience of Surgeons documentation of operation notes. Most of the Surgeons writing the notes were found to document technical aspects well but were found lacking in documentation of secondary details (only 67.7% notes were completed as per RCSE guidelines and in 98% notes the additional variables were found missing). Our audit study highlighted important missing points in our operation note documentation which has been shown in other studies also [3,5-9]. Various reasons can be attributed to poor compliance with guidelines the foremost being poor or no formal training in documentation of operation notes in accordance with guidelines. Second being time factor in operation theatre compelling some surgeons to cut short notes without understanding the need for documenting the details with precision for clinical and medico legal use.

Personal Data: Patients name, age, gender and hospital registration number were documented in all cases as our data is electronically stored in HIMS at the time of patients visit to hospital. This is in contrast to other studies [6,9,14,15] reviewed where these variables were found lacking in 32-54% cases. There are good chances of operation notes getting misplaced or lost due to lack of patients documentation in centers where it is hand written. There was good documentation of date and timing of surgery with compliance of nearly 95% but in 5% the start and end time of surgery were not recorded accurately. This is comparable to other studies [3,6,9,14].

In 80.6% (n=242) cases the operation notes were written by operating surgeon and in 19.4% (n=58) by assistant whereas in other studies (9,11,13,14) 90-100% operation notes were written by operating

surgeons . Only 15(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(3,17).Anesthetist and scrub nurse names were recorded in all cases similar to other studies (14, 18) .In contrast Hamza et al [9] in their study found that Anesthetist name was recorded in 13.9% and scrub nurse in 0.9% cases only. Provisional diagnosis was recorded in all cases but Final diagnosis based on intra operative findings was not changed in 72.4% cases which is similar to other studies [9,18].where it was missing to the tune of 77% to 100% respectively .Other studies [6,15] only in 10-15 percentage of cases it was missing.

Correct ICD-10 coding is important in all cases in order to avoid Medical negligence law suits and delay in claim payment [2,19].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% [3,9,14,15,18].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[8,20].

Anesthetist notes: Type of anesthesia, drugs used and any adverse events during anesthesia were documented well in 92% cases in contrast to other studies where it was recorded in 68% [11], 80.6% [14] and 94% [9] cases respectively .Consent forms were completed in all cases but in 80.4% cases consents were obtained by non operating doctor which is similar to other studies [21] where in 53% cases consents were obtained by junior doctors. Insufficient informed consent by junior doctors , non operating surgeons risks undermine the validity of consent and may not protect the surgeons in case of medico legal complaints in the court of law.

Patients positioning during surgery was documented properly in 73% cases which is better than study in UK by SARCO [22]. There was poor documentation of draping in 81% cases with no mention of solution used or skin preparation in 74% cases which is similar to reports by other authors also [23]. Prophylactic antibiotics during our surgical procedure are routinely prescribed but our records found that in only 81.6% cases it was documented in operation notes which is comparable to other studies also [3,24,25] .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 there was poor documentation of amount of pressure applied and tourniquet timings. Similar findings were found in other studies [8,24,25]. Surgical approach and incision type were clearly mentioned in 74% cases which is comparable to other series with varying percentages 60.8% [6] , 80.1% [24].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%[16] and 80.1% [24] . Operative complications were not recorded in 26.4% cases which is similar to other studies where poor documentation in detailing complications was found [7,9,16,24,26]. Kawa et al [6] however reported only 2.5% intra operative complications. Documentation of extra surgical procedures performed were found missing in 40.6% cases and tissues removed during surgery was not documented in 78.5% cases.Similar findings were found in other studies also with varying percentages [6,9,15,18,25,26] . Implants and prosthesis used was recorded well in 62.6% cases. This is in contrast to other studies where there is poor documentation of around 30% in cases where implants were used [8,22,24,25]. Type of fluid and irrigation used was documented well in 80.4% cases.Surgical wound closure was well documented in 89% cases but incomplete details as regards suture material used was found in 96.4%

cases which is similar to other studies also [3,6,7,9,13,14]. Poor documentation of intra operative blood loss was seen nearly 88.6% cases which is comparable to other studies [23,26,27]. Majority of orthopedic trauma surgery is done with use of fluoroscopy but in none of the cases the radiation exposure time and number of fluoroscopy shots taken were documented. Post operative instructions were clearly written in 96.6% cases which is much better than other studies[3,6,9,14,15] which have reported lower percentage of proper documentation of postoperative notes. In our series post operative rounds were lead by senior doctor in 84.2% cases in contrast to study from UK by Rowland's et al [28] who have 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 the basic guidelines remain the same. Further improvement in documentation of operation notes can be made by

- Providing operation note Performa's or Aide memoire for better documentation of notes[9,10,20,26]
- Introduction of electronic smart note templates which are superior to hand written notes by removing the illegibility of hand written notes and help in keeping the documentation permanently stored [10,14] Hand written notes have been found to be non defensible in the court of law in medico legal cases[5,12,13]
- Most important is introduction of structured training in operation note documentation to new staff members inducted in the respective departments. Lack of education and training leads to large gaps in documentation.
- Frequent supervision of junior surgeons by senior surgeons in operation note documentation.
- Avoid use of abbreviations in note keeping and in diagnosis as it will help in avoid ambiguities in recording of notes propely.

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 computerised data, thereby limiting the number, quality, and completeness of variables that can be obtained in some cases.

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 audits in order to maintain continuity of proper recording of operative notes. Further adopting operative note performa that includes sections for RCS guidelines will ensure recording operative notes more effectively. Formal introduction of teaching writing operative notes in the curriculum at early stage of surgical training will in the long run improve documentation and patient care.

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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

UNDER PEER REVIEW

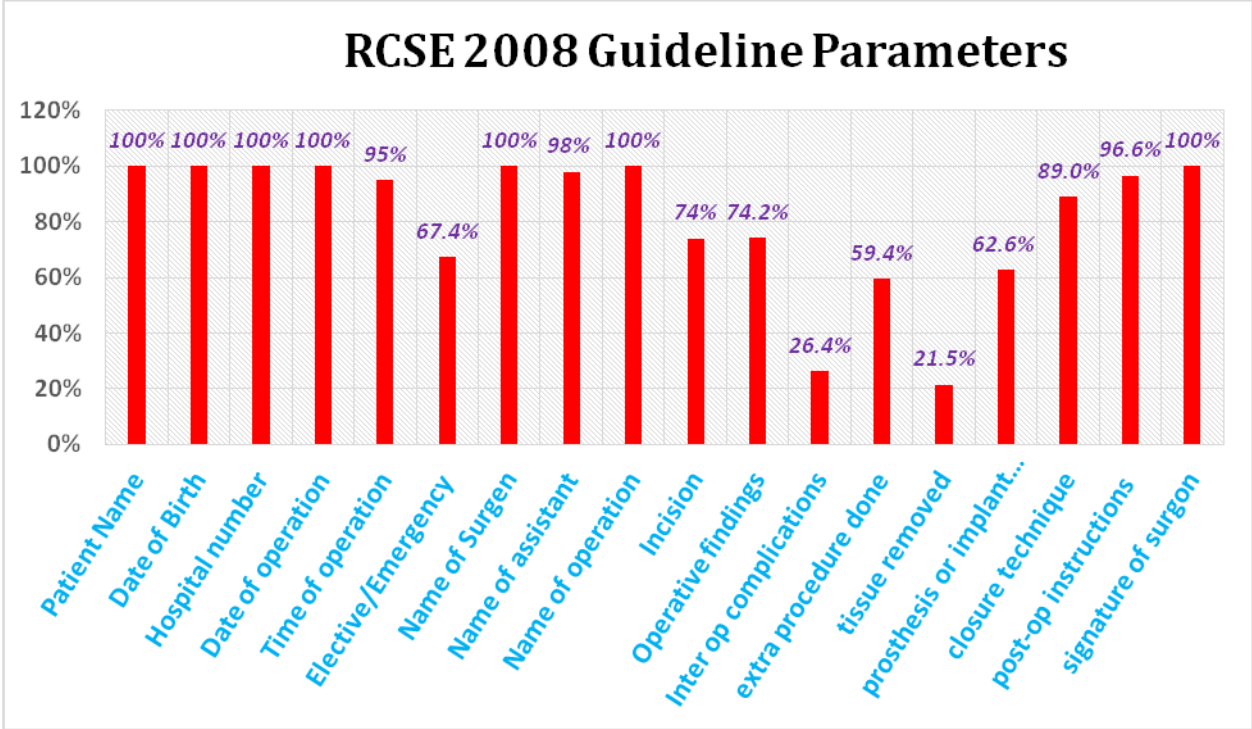


Fig 2: RCSE 2008 Guideline Parameters

UNDER PEER REVIEW

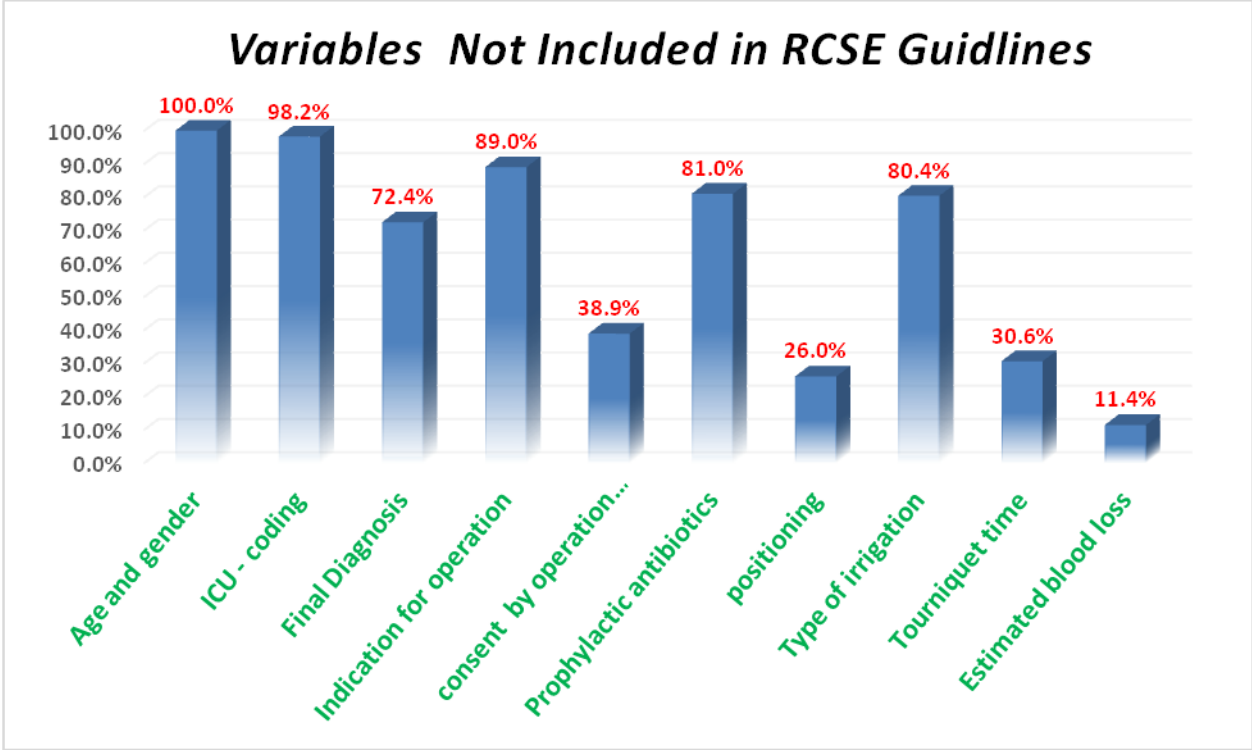


Fig 3: Variables Not Included in RCSE Guidelines

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