Introducing a proforma to improve clinical care in trauma surgery

Introduction: Accurate trauma operative details are an important part of the care of trauma patients. This study evaluated the adequacy of handwritten operative notes for trauma patients and whether they comply with the standards set by the Royal College of Surgeons of England for optimizing clinical practice in a busy district general hospital.

Patients and methods: Fifty consecutive sets of handwritten trauma operative notes were reviewed prospectively. A standardized printed proforma was introduced and then another 50 consecutive sets of notes were reviewed. The results were analysed using the Student *t*-test to obtain two-tailed *P* values comparing the mean difference between percentages of missing data for both cycles.

Results: Out of 24 parameters examined, 19 showed improvement after introducing the standardized proforma in trauma surgical notes. There was an overall significant improvement in the studied parameters (P= 0.0134), with a mean difference of 19.3% of missing data for both cycles.

Conclusions: These results suggest that a standardized prestructured operative note proforma in trauma surgery is a useful tool in recording the operative data, thus helping to improve the medical care provided. It would also provide medicolegally sound evidence of a procedure when needed and so be more beneficial for the surgeon if routinely used. The authors recommend its regular use in different surgical specialties.

Proficient documentation and record keeping are important pillars of good clinical practice. In the trauma setting, operative notes are essential for adequate record keeping as a well-defined precise postoperative plan is crucial for the continuity of medical care. Moreover, clear operative notes are important tools in research and have a well-established medicolegal significance. This importance had been clearly outlined by a range of governing bodies (British Orthopaedic Association and British Association for Surgery of the Knee, 1999; General Medical Council, 2001; Royal College of Surgeons of England, 2008). In 2008, the Royal College of Surgeons of England published their guidelines for adequate operative notes. Many governing bodies worldwide recommend the routine use of the Royal College of Surgeons of England guidelines in operative documentation.

Mr Amr S Hussien *is Clinical Fellow in the Department of Trauma and Orthopaedics, Epsom & St. Helier University Hospitals NHS Trust, Carshalton, Surrey,* **Mr Mohamed A Imam** *is Lecturer and Consultant in Trauma and Orthopaedic Surgery in the Faculty of Medicine, Suez Canal University, Ismailia 41111, Egypt,* **Mr Mohamed Elsherbiny** *is Research Projects Leader in the Department of Trauma and Orthopaedics, South West London Elective Orthopaedic Centre and* **Mr Najab Ellahee** *is Consultant Orthopaedic Surgeon in the Department of Trauma and Orthopaedics, Epsom & St. Helier University Hospitals NHS Trust, Carshalton, Surrey*

Correspondence to: Mr MA Imam (mohamed.imam@aol.com)

This study assessed the adequacy of documentation of handwritten operative notes in trauma surgery in light of the guidelines set by the Royal College of Surgeons of England, to identify possible areas of improvement, implement any necessary changes and assess the impact of those changes.

Methods

In an attempt to improve medical practice, the authors carried out a study in their trauma unit looking at the quality of documentation in operative surgical notes, using the criteria recommended by the Royal College of Surgeons of England as the standard to which the operative notes were compared. A prospective review of 50 consecutive sets of trauma operative records of patients who had surgeries between September and November 2012 was undertaken. Only trauma cases were included. None of the surgeons in the trauma unit were aware that the study was being performed, and notes made by surgeons who were carrying out the study were excluded to avoid bias.

After this initial cycle a new proforma was drafted and introduced (*Figure 1*), based on the parameters for *Good Surgical Practice* set out by the Royal College of Surgeons of England (2008). However, these parameters were aimed at general surgical specialities and different information is often included in the operative documentation in a trauma setting. A pilot survey was undertaken in which 30 questionnaires were handed to senior house officers, house officers and nurses in surgical wards in the department asking them to highlight the most important points they think should be included in the operative notes. As a result of this some variables relating to the use of tourniquets and other aspects relevant to trauma and orthopaedics were included in the proforma.

The results of the first round of the audit were presented in the quarterly departmental research and audit meeting and the new proforma was introduced to surgeons in the department after being accepted by all attending surgeons. A teaching session was undertaken with instructions on how the new proforma should be used. The new standardized printed proforma was introduced, replacing the previous one, and operating theatre staff were made aware of these changes. Between January and March 2013, surgeons were asked to use the new proforma and another 50 consecutive sets of trauma operative notes, which only used the new proforma, were analysed with the same inclusion and exclusion criteria as in the previous cycle. Patients were identified from daily trauma list and notes were reviewed in the wards.

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Statistical analysis

The results were analysed using the Student *t*-test to obtain two-tailed *P* values comparing the mean difference between percentages of missing data for both cycles. A *P* value of <0.05 was considered to be significant. All statistical analyses were carried out using SPSS v14.0.0 for Windows (Chicago, IL, USA).

Results

The results of the two cycles of the study are summarized in *Table 1*. Although each cycle included 50 consecutive sets of notes, some parameters were not applicable in some cases. During the initial cycle, it was noted that the consultant in charge and the person who wrote the notes were not always identifiable. Details of tourniquets, when used, were often missing. Other parameters were not mentioned in any of the 50 notes, including length of operation and whether the procedure was urgent or elective.

After introducing a standardized printed proforma, an overall significant improvement in the studied parameters was noticed (*P*<0.0134) (*Table 1*).

Discussion

These results demonstrated that unstructured handwritten operative documentation in trauma surgery is significantly associated with less precision owing to the increased risk of missing vital information. This study has shown that use of a proforma reduces the amount of data left out of records. The inadequacy of the recorded data does not appear to occur at random, as parts of the data recommended by the Royal College of Surgeons in England were more often missed. Thus these parts of the data are likely to be a source of inadequate notes. This could be explained by the fact that the working conditions of trauma surgeons may leave less time to report recalled operative details adequately.

Intraoperative complications or the need for an extra unplanned procedure, which are included in the guideline parameters, do not happen very often. However, having this as a preprinted section that the surgeon can simply cross out or comment on as being not applicable confirms the absence of any intraoperative incidents.

Figure 1. Final pre-printed proforma.

Epsom & St. Helier University Hospitals NHS
NHS Trust
HOSPITAL
UNIT No.
SURNAME (BLOCK LETTERS)
HISTORY SHEET
FIRST NAMES
DATE
CLINICAL NOTES (Each entry must be signed)
Time
Consultant: Anaesthetist:
Surgeon: Type of anaesthesia:
Assistant: Length of operation:
Tourniquet pressure:
Procedure: Urgent Elective Tourniquet time:
Pre-op Diagnosis:
Operative Diagnosis:
Position:
Incision:
Findings:
Procedure:
OPERATION OPERATION OPERATION OPERATION OPERATION OPERATION

DATE
CLINICAL NOTES (Each entry must be signed)
Difficulties/Complications:
Extra procedure (Why?):
Tissue removed:
Added (e.g. Bone graft)
Swabs
Closure:
Post Op plan: Weight Bearing:
VTE:
Sutures Out:
Rehabilitation:
Signature:
Print:

Table 1. Results documented and missed in both cycles

Parameter	Cycle 1 (*n*=50)	Cycle 2 (*n*=50)	Missing data cycle 1	Missing data cycle 2
Anaesthetist name	22	40	56%	20%
Assistant name	47	50	6%	0%
Name of consultant in charge	43	50	14%	0%
Date of operation	50	40	0%	20%
Diagnosis	17	50	66%	0%
Length of operation	0	44	100%	12%
Operative finding	31	50	38%	0%
Position of the patient	24	50	52%	0%
Signature/identification	35	50	30%	0%
Surgeon name	48	50	4%	0%
Time of the operation	9	13	82%	74%
Type of anaesthesia	40	50	20%	0%
Urgent/elective procedure	0	48	100%	4%
Wound closure	50	50	0%	0%
Operative procedure	50	50	0%	0%
Patient identification	50	50	0%	0%
Postoperative plan	50	50	0%	0%
Incision	42 (*n*=45)	50	3%	0%
Tissues removed	20 (*n*=23)	17 (*n*=17)	3%	0%
Identification of implant	45 (*n*=46)	50	1%	0%
Weight-bearing status	39 (*n*=43)	47 (*n*=47)	4%	0%
Thromboprophylaxis	30 (*n*=45)	43 (*n*=47)	15%	4%
Tourniquet pressure	3 (*n*=5)	6 (*n*=6)	2%	0%
Tourniquet time	4 (*n*=5)	6 (*n*=6)	1%	0%

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When a standardized printed proforma was used, the data recorded significantly improved. Using a proforma with pre-printed parameters may decrease the incidence of missing data partly because it eliminates individual variation in recalling operative details. Additionally, all surgeons are obliged to provide a response to every item in the proforma. This could lead to improved patient care, and less medicolegal liability. Moreover, the proforma used here does not require high-tech software to generate, so it could be used in any institution.

The consequences of lack of identification, missing operative details and incomplete postoperative plans of care can be devastating. They might confuse nurses and junior doctors. There is a risk of discontinuity of care because of miscommunication between staff and patients.

One study (Kawu et al, 2011) highlighted the association between adequate documentation and the person completing this. They reported that operative notes are of a higher standard when made, or at least supervised, by the operating surgeon. Proformas have been shown to be superior to handwritten notes in a number of different specialties (Bateman et al, 1999; Rugby et al, 1999).

Barritt et al (2010) compared handwritten operation notes to computerized proformas for hip hemiarthroplasty and showed superiority of the computerized proformas. Similarily Morgan et al (2009) audited the quality of operative notes for total knee replacements in relation to guidelines set by the British Orthopaedic Association and found that the use of a checklist improved surgeons' adherence to these guidelines. They also recommended making the data points an integral part of the operation note for all total knee replacements.

With a health-care system that is slowly moving towards more comprehensive, paperless patient management systems, it is inevitable that in the orthopaedic community the time for change will come. This audit has clearly demonstrated that when a clear form is provided to aid documentation, a higher degree of data capture can be achieved. However, the effectiveness of such proforma in the wider orthopaedic community can only be determined through wider use of the form in different hospitals and with different consultants. The authors believe that a more comprehensive proforma covering more procedure-specific items and a digital system should be developed for such proformas to be widely used.

Although recommending thromboprophylaxis or recording intraoperative complications are crucial for proper patient care, other aspects like operative time, positioning or even assistant name are not so critical to this. However, recording all items could be very important from a medicolegal perspective.

There are also some downsides to using proformas. Filling the proformas could be merely considered a box-ticking exercise – boxes may simply be ticked and questions answered just to fill the gaps. The authors cannot confirm that this did not occur in this study. Another possible problem is that some details might be omitted because of limited space on a printed form. Thus the authors recommend a more detailed design of this printed proforma or use of a specialized program for filling out operative details with bespoke boxes for different orthopaedic procedures.

This audit was limited as it did not closely examine the possibility of data errors or omitting of information as a result of the space provided. All surgeons were not equally represented as it was a cross-sectional sample and surgeons had different operating schedules.

Conclusions

Using a standardized proforma for operation notes offers more prompts to the surgeon, leading to significant improvements in quality of documentation. Use of the proforma resulted in better and more legible notes, which should have positively affected the care of the patients and improved communication between medical teams. **BJHM**

Conflict of interest: none.

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LEARNING POINTS

- Handwritten unstructured operative notes in trauma surgery could be a source of inadequacy of patient care.
- The use of a standardized printed proforma improved data capture.
- Incomplete operative details or postoperative instructions might lead to miscommunication between the treating surgeon and other specialities.

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