



## The surgical admissions proforma: Does it make a difference?



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### HIGHLIGHTS

- This study compares freehand documentation versus a surgical admissions proforma.
- The proforma increased documentation in 28/32 criteria set by RCSEng.
- 89% of the surgical team preferred its use to freehand clerking.
- Audit quality control was also more reliable with the proforma.

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### ABSTRACT

Admissions records are essential in communicating key information regarding unwell patients and at handover of care. We designed, implemented and evaluated the impact of a standardised surgical clerking proforma on documentation and clinician acceptability in comparison to freehand clerking. A clerking proforma was implemented for all acute general surgical admissions. Documentation was assessed according to 32 criteria based on the Royal College of Surgeons of England guidelines, for admissions before ( $n = 72$ ) and after ( $n = 96$ ) implementation. Fisher's exact test and regression analysis were used to compare groups. Surgical team members were surveyed regarding attitudes towards the new proforma. Proforma uptake was 73%. After implementation, documentation increased in 28/32 criteria. This was statistically significant in 17 criteria, including past surgical history ( $p < 0.01$ ), medication history ( $p = 0.03$ ), ADLs ( $p = 0.02$ ), systems review ( $p < 0.01$ ), blood pressure ( $p < 0.01$ ), blood results ( $p = 0.02$ ) and advice given to the patient ( $p = 0.02$ ). The proforma remained beneficial after regression analysis accounted for differences in time of day, seniority of the doctor and nights or weekends (coefficient = 0.12 [ $p < 0.01$ ]). 89% of the surgical team felt the form improved quality of documentation and preferred its use to freehand clerking. 94% felt it was beneficial on the post-take ward-round. Audit quality control was also more reliable with the proforma (inter-observer agreement = 99.3% [ $\kappa = 0.997$ ]) versus freehand clerking (97.1% [ $\kappa = 0.941$ ]). Our study demonstrates that a standardised surgical clerking proformas improves the quantity and quality of documentation in comparison to freehand clerking, is preferred by health professionals and improves reliability of the audit quality control process.

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### 1. Introduction

Accurate documentation in clinical records has been shown to improve patient care and clinician performance [1]. Admissions

records are particularly essential in communicating key information when the patient is most unwell. The NHS Quality and Safety Programme states that a, "unitary document needs to be in place, issued at the point of entry, which is used by all healthcare professionals and all specialties throughout the emergency pathway" [2]. This standard applies to both medicine and surgery. Inadequate documentation has been linked with poor patient care. A recent Dutch study of 7926 medical and surgical patients found that poor quality of documented patient information was associated with a

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higher rate of adverse events (AEs) [3]. Furthermore, inadequate documentation has been implicated as a major source of error for clinical coders [4] and has medico-legal ramifications. Evidence has shown that doctors who record more data are likely to detect AEs [5]. This makes high quality documentation even more significant given the extremely narrow margin for error in the surgical environment.

The Royal College of Surgeons of England (RCSEng) Guidelines for Clinicians on Medical Records and Notes (1994) provides information regarding what a surgical admissions document should contain [6]. This includes patient history, past medical history, medication history, social history, examination including height and weight, and medical care plan including reports of all investigations, treatments and verbal advice given to the patient and their relatives. The National Confidential Enquiry into Patient Outcome and Death (NCEPOD) aimed to identify remediable factors in the care of emergency adult admissions. They found that despite recommendations from RCSEng and corresponding advice from the Royal College of Physicians regarding medical patients, the standard of initial assessment was poor or unacceptable in 7.1% [7]. Interestingly, they also found that the use of proformas aided initial assessment, but they criticised the lack of standardisation of the information recorded in proformas across the National Health Service (NHS).

Evidence also suggests that printed clerking forms are preferred by healthcare professionals in general surgery [8], orthopaedics [9,10], and general medicine [11,12]. Audit has shown that key information may be omitted frequently [13], however despite this many hospitals do not have structured clerking documents as policy.

Although there are numerous studies that audit the compliance of either freehand case notes or admissions proforma, there is surprisingly a paucity of studies directly comparing the efficacy of one against the other in surgical admissions. We aimed to assess whether the quality of documentation was improved when using a standardised surgical clerking proforma compared to freehand clerking at a district general hospital. We also assessed the attitudes of surgical team members towards the new proforma.

## 2. Methods

The surgical admissions clerking proforma was designed based on standards set by RCSEng [6], with input from senior consultants. On-call teams were requested to use the proforma instead of freehand clerking and were not aware that they would be audited. Three data collectors independently conducted a retrospective audit of notes over a two-week period before and two-week period after implementation of the clerking proforma. Prior to implementation of the proforma, all admissions clerkings were performed freehand.

Acute trauma, orthopaedics, urology, elective admissions and patients initially clerked by other specialties were excluded from the study. Notes were also excluded if the patients had been clerked by the authors. Documentation both prior to and after implementation of the proforma was assessed according to the presence or absence of 32 criteria based on the RCSEng guidelines (see Table 1). Age criteria were applied in certain elements for relevance: package of care, activities of daily living (ADLs) and abbreviated mental test score (AMTS) were evaluated in those over 65 years, smoking and alcohol intake in those over 13 years, employment if between 16 and 70 years and a urinary pregnancy test if female between 13 and 50 years. Data was analysed using Stata 10 (StataCorp, Texas), and Fisher's exact test applied to compare the difference in documentation before and after introduction of the proforma. Regression analysis was performed to assess whether

**Table 1**

Criteria for documentation based on Royal College of Surgeons of England guidelines.

Presenting complaint	Oxygen saturations
History of presenting complaint	Respiratory rate
Past medical history	Cardiovascular examination
Past surgical history	Respiratory examination
Medication history	Abdominal examination
Allergies	Neurological examination
Family history	Abbreviated mental test score <sup>a</sup>
Package of care <sup>a</sup>	Height
Activities of daily living <sup>a</sup>	Weight
Alcohol <sup>b</sup>	Blood test results
Smoking <sup>b</sup>	Urinary pregnancy test <sup>d</sup>
Employment <sup>c</sup>	Plan
Systems review	Advice to patient
Blood pressure	Name
Heart rate	Grade
Temperature	Time

<sup>a</sup> Assessed in over 65 years of age.

<sup>b</sup> Assessed in over 13 years of age.

<sup>c</sup> Assessed between 16 and 70 years of age.

<sup>d</sup> Assessed females 13–50 years of age.

results were statistically significant after accounting for potentially confounding variables. A *p*-value of less than 0.05 was considered statistically significant. Inter-observer variation between the three data collectors was calculated by re-auditing 14 records in each group and noting the number of discrepancies.

Questionnaires were issued to 20 doctors and nurses who had used or seen the proforma in order to evaluate their attitudes towards its implementation. The questionnaires were answered anonymously and responses were measured on a Likert scale ranging between 1 (strongly disagree) to 5 (strongly agree).

An ethics review was not sought as the study was registered and approved as an audit within the hospital, which is exempt from this process.

## 3. Results

Notes were audited for the period before (*n* = 72) and after (*n* = 96) introduction of the proforma. After introduction, the proforma was utilised in 73% of cases (70/96 records). Out of 32 criteria, documentation improved in 28, of which 17 were statistically significant (see Table 2).

Key criteria in the history including previous surgical history (*p* < 0.01), medication history (*p* = 0.03), family history (*p* < 0.01), package of care (*p* < 0.01), ADLs (*p* = 0.02), alcohol intake (*p* = 0.01) smoking (*p* = 0.03) and systems review (*p* < 0.01) were significantly improved with the proforma. Documentation of several essential elements of the examination were also significantly improved including blood pressure (*p* < 0.01), heart rate (*p* = 0.04), temperature (*p* = 0.03), oxygen saturations (*p* = 0.03), respiratory rate (*p* = 0.04) and neurological examination (*p* < 0.01). Documentation of urinary pregnancy test (*p* = 0.03) and the information given to patients (*p* = 0.02) was also improved.

Documentation of systems review (7% before, 40% after), neurological examination (3% before, 29% after), and advice given to the patient (4% before, 16% after) were all considerably improved although still poorly documented despite the proforma. AMTS was also considerably improved (0% before, 10% after), although this result was not statistically significant. Documentation of employment status, respiratory and cardiovascular examination, height and weight did not improve with the proforma and remained poorly documented. Documentation of presenting complaint, history of presenting complaint, past medical history, allergies, abdominal examination, plan, name, grade and time were not

**Table 2**  
Comparison of documentation before and after proforma introduction.

	Free paper (%) (n = 72)	Proforma (%) (n = 96)	Fisher's test P value
Presenting complaint	97	98	1
History of presenting complaint	97	98	1
Past medical history	88	93	0.30
Past surgical history	46	76	<0.01 <sup>b</sup>
Medication history	61	77	0.03 <sup>b</sup>
Allergies	71	74	0.73
Family history	25	51	<0.01 <sup>b</sup>
Package of care <sup>a</sup>	10	58	<0.01 <sup>b</sup>
Activities of daily living <sup>a</sup>	20	58	0.02 <sup>b</sup>
Alcohol <sup>a</sup>	55	76	0.01 <sup>b</sup>
Smoking <sup>a</sup>	55	73	0.03 <sup>b</sup>
Employment <sup>a</sup>	31	36	0.83
Systems review <sup>a</sup>	7	40	<0.01 <sup>b</sup>
Blood pressure	56	77	<0.01 <sup>b</sup>
Heart rate	67	81	0.04 <sup>b</sup>
Temperature	61	78	0.03 <sup>b</sup>
Oxygen saturations	51	69	0.03 <sup>b</sup>
Respiratory rate	47	64	0.04 <sup>b</sup>
Cardiovascular examination	29	25	0.60
Respiratory examination	54	54	1
Abdominal examination	92	90	0.80
Neurological examination	3	29	<0.01 <sup>b</sup>
Abbreviated mental test score	0	11	0.23
Height	0	2	0.51
Weight	0	2	0.51
Blood test results	53	71	0.02 <sup>b</sup>
Urinary pregnancy test <sup>a</sup>	17	60	0.03 <sup>b</sup>
Plan	99	98	1
Advice to patient	4	16	0.02 <sup>b</sup>
Name	92	97	0.17
Grade	96	97	1
Time	71	79	0.28

<sup>a</sup> Package of care, activities of daily living, AMTS were assessed in over 65yrs of age; smoking and alcohol in over 13 years of age; employment in those aged 16–70 years of age; urinary pregnancy test in females age 13–50 years.

<sup>b</sup> Denotes statistical significance ( $p < 0.05$ ).

statistically improved with the proforma but were documented generally well, in at least 70% of case notes.

The positive impact of the proforma remained statistically significant after linear regression analysis was performed to account for variables including time of day clerked, nights and weekends and the grade of doctor. The linear regression co-efficient was 0.12 ( $p < 0.01$ ). This meant that taking into account these variables, the presence of the proforma was still likely to increase documentation by 12%, equivalent to approximately 4 out of the 32 criteria assessed.

As an audit quality control measure, 15 case notes prior to proforma implementation and 14 notes after implementation were re-audited by a different author and the data collected compared. A total of 17 net discrepancies over 928 individual pieces of data were found, thus overall inter-observer agreement was 98.2% ( $\kappa = 0.963$ ). Interestingly, inter-observer agreement was higher with the proforma (99.3% [ $\kappa = 0.997$ ]) in comparison to freehand clerking (97.1% [ $\kappa = 0.941$ ]).

A total of 20 healthcare professionals were surveyed, including 11 foundation training doctors, 3 registrars, 4 senior nurses, and 2 other nurses. 87% of the doctors working in the general surgery department (excluding consultants and the authors) filled out questionnaires. The responses were overwhelmingly positive with 100% of responders reporting that they did not prefer its use to free

paper and 50% responding that the proforma improved the quality of patient care (see Fig. 1).

#### 4. Discussion

We aimed to assess the impact of a standardised surgical admissions proforma in comparison to freehand clerking and evaluate the attitudes of surgical team members after its implementation. This study shows that documentation of a patient's history, medication and clinical signs were improved with use of a clerking proforma. This is consistent with other studies that have shown the use of pre-printed proformas improve documentation during admission [9–12].

Consistent and accurate information is essential at all times during a patient's course in hospital, not least during admission when the information gathered is referred to throughout patient stay, the patient is often most unwell and handover of care is occurring. Clinical records, whilst instrumental for patient care, also serve as medico-legal evidence. A high percentage of litigation relies substantially on documentation in the medical record to determine outcomes and it is acknowledged that if actions or discussions were not documented then they were not performed [14].

As well as improving quantity and quality of information documented, there is evidence that structured documents like admissions proformas have added benefits over free history sheets by enhancing the interpretation of clinical records and by improving doctor performance. Structured documents make it quicker and easier to gain an overview of a patient and find specific information within the clerking document [11,15]. One of the mechanisms behind this is the consistency of subheadings appearing in a predefined order [15]. This may explain why our proforma was found to be helpful on post-take ward rounds by 94% of those surveyed and in identifying the start of admission by 89%. It has been hypothesised that improved medical record structure will improve outcomes for patients and costs of healthcare by reducing the errors and time delays associated with poor design [16].

Several different studies have shown that pre-printed forms improve doctors' performance [1], from improving asthma management [17] to improving clinical response to antenatal risk factors [18]. Such forms have been described to teach and serve as continuous and ongoing reminders as to best practice [19]. In our study of surgical admissions, use of the proforma more than doubled documentation of family history, package of social care, ADLs, systems review, neurological examination, AMTS, and the advice given to the patient. The proforma may have prompted some clinicians to ask extra questions or perform examinations that otherwise may have been omitted. Furthermore, documentation of such elements may even have affected clinical decision-making. For example, a documented low AMTS may have affected the consenting process or the decision to operate. In addition, the near four-fold increase in documentation of urinary pregnancy test with the proforma may affect surgical management and decision-making.

There are some methodological limitations to our study that need to be addressed. We did not quantify the effect of our clerking sheet on other aspects of clinician performance apart from documentation, nor did we examine whether patient outcomes improved with the use of the proforma. However numerous studies have demonstrated that poor quality of admissions documentation is likely to result in negative patient outcomes [3]. Furthermore, our survey demonstrated that the majority of surgical team members felt the proforma helped improve the patient's quality of care. Another limitation of our study is that there was suboptimal uptake of the proforma (73%). However it is possible that the use of free-hand clerking in 27% of cases underestimates the impact of the

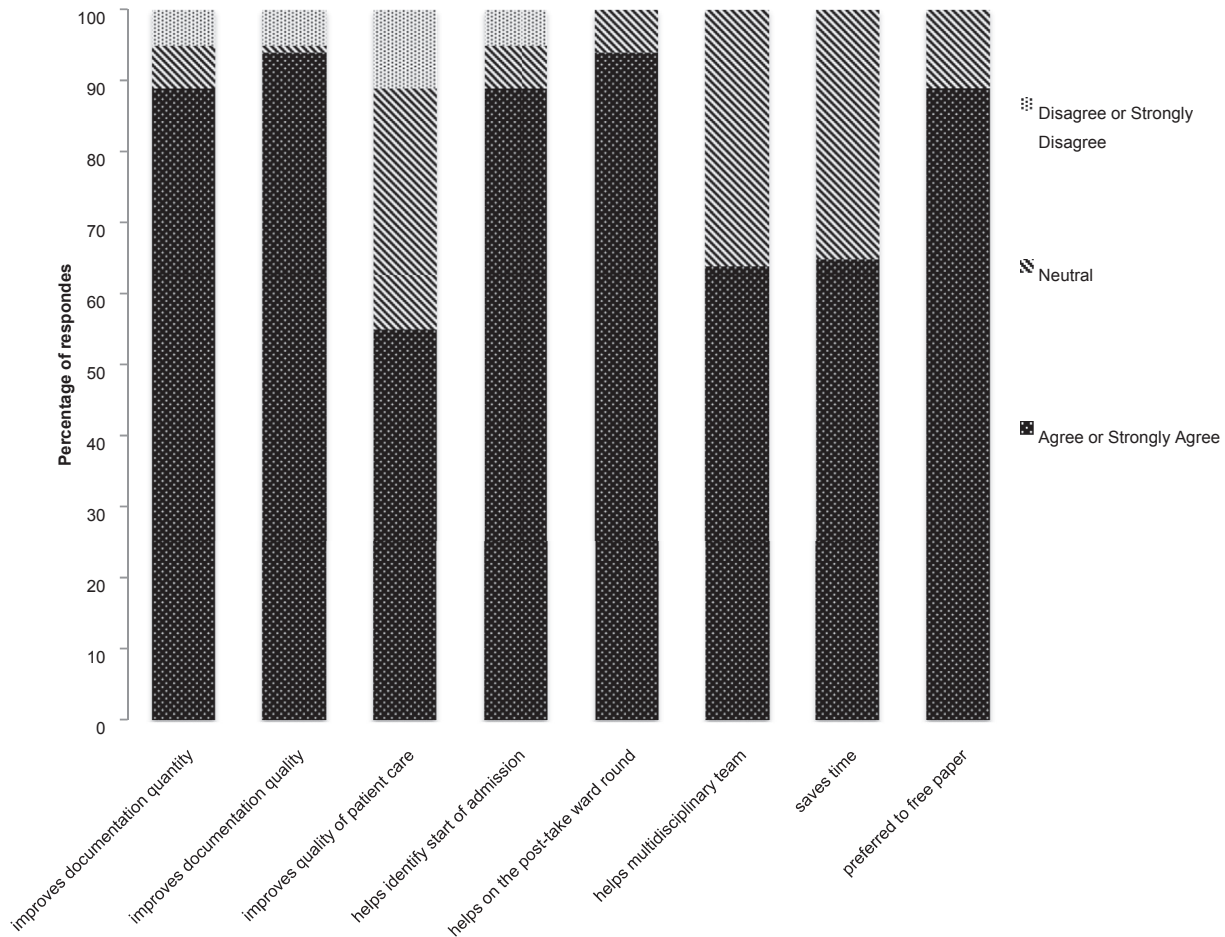


Fig. 1. Opinions of the surgical team ascertained by survey (n = 20).

proforma, and if further measures were taken to increase its uptake, a greater beneficial effect may be seen.

Whilst the proforma may have prompted some clinicians to act more comprehensively, other clinicians may not have changed their clerking style. This explains why although the proforma greatly improved documentation of many elements, the absolute percentages of case notes in which some of these criteria were documented remains low. For example only 40% of patients had a documented systems review. Indeed, documentation of certain elements were not improved at all and remained poor. Questions regarding employment and examinations of the respiratory and cardiovascular systems may have been felt to be irrelevant to a surgical clerking. However these examinations are essential to determine baseline cardiac function and respiratory reserve, and allow the clinician to detect any major cardiorespiratory problems that may affect fluid resuscitation, anaesthesia, surgery or prognosis. Occupation status is also relevant when considering the implications of surgical intervention. Education of the surgical team would be instrumental in improving how frequently these questions and examinations are included and documented. Height and weight, specifically named on the RCSEng guidelines, were not likely to have been available at the time of initial clerking and are traditionally measurements taken and documented by nursing staff.

It is also interesting to note that the use of the proforma made subsequent audit quality control more accurate. This is likely to be due to the fact that information is more clearly presented and easier

to compare between patients when referring to a proforma as opposed to freehand. This is important in terms of clinical governance, and tools that make this process easier and more reliable assist in maintaining and improving standards of patient care.

The NHS Quality and Safety Improvement Programme audited all acute London hospitals against a series of standards including the presence of a unitary document, which documented the patient's progress from admission to discharge [2]. It found that only 31% (8/27) surgical departments had such a document in place. Our study suggests that there is significant scope for improvement in the information recorded at admission by implementing proformas in the majority of trusts that have not yet done so.

A survey of over 1000 doctors showed that clinicians overwhelmingly prefer the use of an admissions proforma for acute medical patients [20]. In our department, 94% of those surveyed preferred using the proforma compared with freehand clerking. It has been suggested that proformas could limit free expression [19], however doctors in our study seemed to prefer them and the hypothetical negatives should be balanced against the benefits of ensuring adequate documentation and clinical care. If surgical proformas do indeed improve the quality of documentation as our study suggests, it is important that their use is preferred by clinicians, as this will likely result in a higher uptake and thus overall improved quality of documentation.

In summary, documentation during patient admission is crucial and considerable variability exists locally and nationally. Our study shows that surgical clerking proformas both improve



documentation and are preferred by the surgical team. Furthermore they are likely to have a positive impact on patient outcomes, doctor performance, and audit quality control, thus providing a consistent, standardised approach to each admission.

#### Conflicts of interest

None.

#### Funding

None.

#### Consent

Not applicable.

#### Ethical approval

Not deemed necessary as the project fell under local quality improvement/audit, which was exempt from ethical approval.

#### Author contribution

Dr Jasmine Ehsanullah made substantial contributions to the study conception and design, data collection, data analysis and interpretation, write-up of the article and final approval for submission.

Dr Umar Ahmad made substantial contributions to the study conception and design, data collection, data analysis and interpretation, write-up of the article and final approval for submission.

Mr Kohmal Solanki made substantial contributions to data analysis and interpretation, write-up of the article and final approval for submission.

Dr Justin Healy made substantial contributions to the study conception and design, data collection, data analysis and interpretation, write-up of the article and final approval for submission.

Mr Naim Kadoglou made substantial contributions to the study conception and design, revising the article content and final approval for submission.

#### Guarantor

Dr. Jasmine Ehsanullah.

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