

Implementation of Major Trauma App: Usability and data completeness.

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Introduction

The current UK standard for major trauma patients is to record notes in a paper trauma booklet. Through an innovative collaboration between a major trauma centre and a digital transformation industry partner, a Trauma App was developed. Electronic notes have been shown to have fewer errors, granular data collection and enable time stamped contemporaneous record keeping. Implementation of digital clinical records presents a challenge within the context of trauma multidisciplinary trauma resuscitation. Data can be easily accessible and shared for quality improvement, audit and research purposes. This study compared paper and electronic notes for completeness and for acceptability data following the implementation of the Trauma App.

Aim

The aim of this study was to compare the use of digital data collection tool (Trauma App) against the current paper trauma booklet used in the ED at the QEUH, focussing on data completeness and usability.

The Trauma App

The purpose of the app is to support the establishment of a trauma system. (Figure 1) The app enables clinicians to achieve three key aims:

- Robust data collection to enable forensic analysis of clinical care processes.
- Cognitive aids to support and prompt clinicians during trauma care delivery.
- Provision of a reliable framework to deliver care aligned to the highest clinical standards to reduce variability.



Figure 1. Example Screens from Trauma App

Methodology

Trauma team members who performed scribe function attended training for the newly launched Trauma App. Two staff members acted as scribe, using either the paper trauma booklet or Trauma App, and attended major trauma calls (Table 1). A framework for comparison of paper and electronic notes was created and used for a retrospective review of major trauma patients' notes. Statistical analysis was performed using a two-tailed t-test. Staff using the Trauma App completed a System Usability Score questionnaire.

Table 1. Trauma case demographics

Case	Team Leader Grade	Patient Age	Patient Gender	Mechanism of Injury	Trauma Tier	ISS Score	Scribe Paper	Scribe App
1	Consultant	50	F	Fall	2	13	NR	NR
2	Registrar	48	M	Fall	NR	9	Reg	SN
3	Registrar	36	F	Fall	1	2	MTC	NR
4	Consultant	26	M	Fall	1	10	SN	NR
5	Consultant	52	M	Fall	NR	3	NR	NR
6	Speciality Doctor	81	F	Fall	1	13	MTC	NR
7	Consultant	31	M	Assault	1	12	MTC	NR
8	Registrar	75	F	RTC	1	13	MTC	NR
9	Consultant	19	M	RTC	NR	8	NR	NR
10	Consultant	53	M	RTC	2	9	MTC	NR
11	Registrar	53	M	Fall	1	20	StuN	NR
12	Consultant	84	F	Fall	2	75	NR	NR
13	Consultant	20	M	RTC	1	1	MTC	NR
14	Consultant	38	M	Fall	1	13	SN	NR
15	Consultant	43	M	RTC	1	12	MTC	MTC
16	Consultant	40	M	Fall	2	8	MTC	NR
17	Registrar	73	M	RTC	1	6	MTC	NR

NR = Not Recorded, Reg = Registrar, MTC = Major Trauma Coordinator, RTC = Road traffic collision, StuN = Student Nurse, ISS = Injury Severity Score

* Authors affiliated to 1,3 have no pecuniary interest in the Trauma App

Results

The mean number of data points collected on paper notes was 24.1, and on electronic notes was 25.7, of a potential 37 key data points per case (Table 2). A further five data points were measured in the 'Rapid Sequence Induction' section of the app, but only one case required this intervention. It was therefore excluded from the data analysis. The mean percentage completeness for paper notes was 65.1% (range 13.5 – 81%) and for electronic notes was 69.5% (range 48.6 – 86.5%) (Figure 3).

	Mean		Standard Deviation		95% Confidence Interval	P value
	Paper	Trauma App	Paper	Trauma App		
Preparation	4.82/8	4.59/8	2.32	3.47	-1.90 to 2.37	0.8180
Handover	6.29/8	6.76/8	1.45	1.25	-1.65 to 0.71	0.4102
History	2.59/4	3.24/4	1.50	1.09	-1.59 to 0.30	0.1653
Primary Survey	10.35/17	11.12/17	3.12	1.5	-2.33 to 0.80	0.3170
Total	24.06/37	25.71/37	6.63	3.93	-5.79 to 2.49	0.4116

Table 2. Statistical analysis - comparison of completeness – Paper versus Trauma App

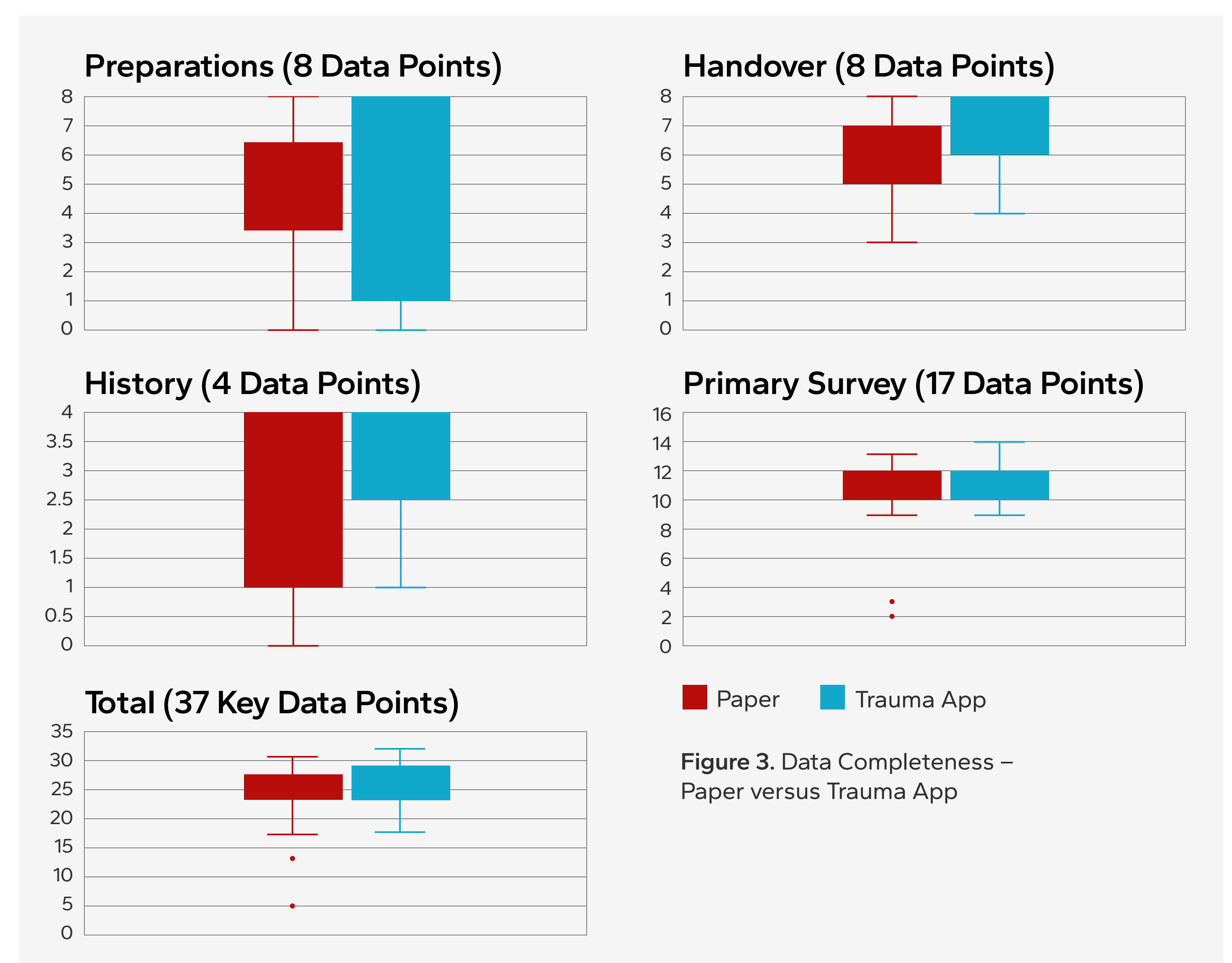


Figure 3. Data Completeness – Paper versus Trauma App

Discussion

Recording accurate patient information during a major trauma call can be challenging and the role of the scribe to accurately record events is critical for immediate and future care. There was no statistically significant difference in completeness of paper and electronic notes, however the mean System Usability Score was 68.4, which is greater than the internationally validated standard of acceptable usability. It is feasible to introduce digital data collection tools enabling accurate record keeping during complex resuscitation and improve information sharing between clinicians.

Conclusion

The study demonstrates equivalence in the completeness of recording patient notes on paper and with the Trauma App. Despite this, there is growing use of the Trauma App and usability scores are encouraging. This study would benefit from a larger number of cases and a study of the effects on accuracy of note taking with familiarisation with the Trauma App over time. A further study could also assess accuracy of digital documentation using video recordings of the trauma case.

References

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