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An experimental comparison of handover methods

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ABSTRACT

INTRODUCTION With the increase in shift pattern work for junior doctors in the NHS, accurate handover of patient clinical information is of great importance. There is no published method that forms the gold standard of handover and there are large variations in practice. This study aims to compare the reliability of three different handover methods.

PATIENTS AND METHODS We observed the handover of 12 simulated patients over five consecutive handover cycles between SHOs on a one-to-one basis. Three handover styles were used and a numerical scoring system assessed clinical information lost per handover cycle.

RESULTS After five handover cycles, only 2.5% of patient information was retained using the verbal-only handover method, 85.5% was retained when using the using the verbal with note taking method and 99% was retained when a printed handout containing all patient information was used.

CONCLUSIONS When patient information is handed over by the verbal only method, very few facts are retained; therefore, this method should be avoided whenever possible. Verbal handover with note taking is shown to be an effective method of handover in our study, although we accept that this is an artificial scenario and may not reflect the reality of a busy hospital. Nearly all information is retained by the printed handout method but this relies on the handout being regularly updated.

KEYWORDS

Continuity of patient care – Medical staff, hospital – Physicians – Professional practice/standards – Communication

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Medical handover is 'the transfer of professional responsibility and accountability for some or all aspects of care for a patient, or group of patients, to another person or professional group on a temporary or permanent basis'.[1] The implementation of the New Deal and the European Working Time Directive has meant that junior doctors are increasingly working in shifts and that handover of clinical information is taking place more frequently. There is reduced continuity of care with patients often being looked after by more than one group of doctors on any given day.[5] In many instances, doctors have no day-to-day contact with patients for whom they are responsible in the out-of-hours period.[2] There are many published examples of cases where poor communication between doctors has had serious consequences for patients;[5] for these reasons, it is now well recognised that accurate handover of clinical information is of great importance to patient safety.[1]

There are currently many different handover methods being used in clinical practice.[4] Often, a verbal handover is conducted, either by telephone or in person, where the recipient of the handover may or may not take notes to refer to over the course of his shift. Some groups arrange for a handover book or folder to be used so that teams can leave messages about patients of particular concern. In this case, there may be no verbal contact at all. Increasingly, more formal pre-prepared handover sheets are being used which contain information about all of the patients belonging to that particular team.[5] This can be typed on a computer and printed out for the on-call doctor for his reference. However, this process inevitably takes more time and effort.

Despite this variation in clinical practice, there is very little prospective experimental evidence in the literature investigating optimal methods of handover. The British Medical Association, in conjunction with the General Medical Council, NHS Modernisation agency, National Patient Safety Agency and the Junior Doctors Committee have recently published guidelines[4] for safe handover, but these are based largely on expert opinion. We designed a study to assess the differences in information retention for different handover styles. The styles examined included a purely verbal style, a verbal with note-taking style and a handover using a pre-prepared sheet.

Patients and Methods

A simulated handover scenario was constructed that involved a one-to-one handover of patients between two ENT SHOs at a time. The handovers took place in a quiet room off the main ENT ward of St Michael's Hospital. Each handover was tape-recorded to allow detailed analysis of the content of the handover.

Twelve fictional patients were created by the investigators. Each patient had 20 data points to be handed over, each point corresponding to a single fact. The data points were chosen to be representative of information that would be handed over during a typical inter-shift handover on a ward and were chosen after an analysis of medical records and handover practice. The potential impact of error or omission of each data point was estimated. The data points were then classified as being important or less important for patient safety. Each fictional patient was allocated an equal number of data points from each category, 16 important and 4 less important. This consistency was used to prevent any patient being easier or more difficult to remember than any other. All 12 patient profiles were then compiled onto a typed data sheet.

The fictional patients were randomly allocated, by use of computer generated random numbers, to one of three groups. Each group of four patients was handed over in a different style. In the 'verbal' group, the patients were handed over verbally with no note-taking by the participant allowed. This group represented a purely verbal handover. The patients in the 'written' group were handed over verbally with the participant taking notes. The patients in the 'sheet' group were handed over by means of giving a typed sheet with all patient details contained on it to the participant and then verbally handing over each point as well.

Five volunteer ENT SHOs from St Michael's hospital were recruited into the study. The first participant was given a formal handover of all 12 patients by the investigator reading from the typed sheets. The order in which the patients were presented, and thus styles used, was assigned randomly at each handover cycle using computer generated random numbers.

After receiving the handover of all 12 patients, the participant waited for 30 min before handing over the patients in the same styles to the next participant. This cycle was repeated until the fifth participant handed the patients back to the investigator.

Two independent investigators observed every handover cycle and recorded the number of data points retained correctly for each patient. With 4 patients in each handover group and 20 data points per patient, there were a total of 80 data points to be handed over in each group. Each investigator was blinded to the results of the other investigator. Only where there was agreement between both investigators would a mark be recorded for each data point. Where discrepancies were found, the tape was consulted and consensus was reached. The differences in the amount of data retained for each handover style was then calculated.

Analysis of data

Data were collected on written score sheets and transferred to a Microsoft Access® database. Data were then exported to SPSS v.11 for analysis. Chi square tests were used to compare relative rates of data loss.

Results

Overall loss of data

The amount of data lost in the three groups varied considerably (Fig. 1). The verbal-only group experienced far more data loss than the others at each stage. Out of 80 data points, 26 (33%) were retained after the first handover and only 2 out of 80 (2.5%) data points were retained after all five handover cycles.

Note-taking during a verbal handover substantially improved the amount of information retained with 92% (73.5/80) of information being retained after the first handover cycle, and 85.5% (68.5/80) of information retained after five handover cycles. However, the most information was retained in the printed sheet group where 100% of information was retained after the first 4 handover cycles, and only one data point (1.25%) was lost in the fifth cycle. After 5 handover cycles, the amount of information retained using the printed sheet was significantly more than when using note-taking ($P < 0.05$) or verbal only methods ($P < 0.001$)

Effect of importance of data

Figure 2 shows that data points deemed important were omitted at a similar rate as those deemed less important. In the verbal-only group, only 2 out of the 64 points deemed

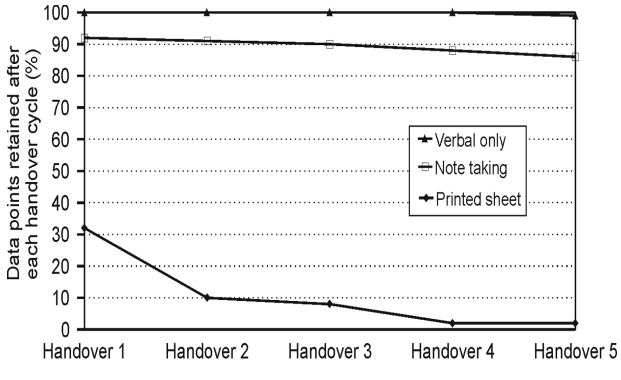

Figure 1 Percentage of data points retained after each handover cycle.

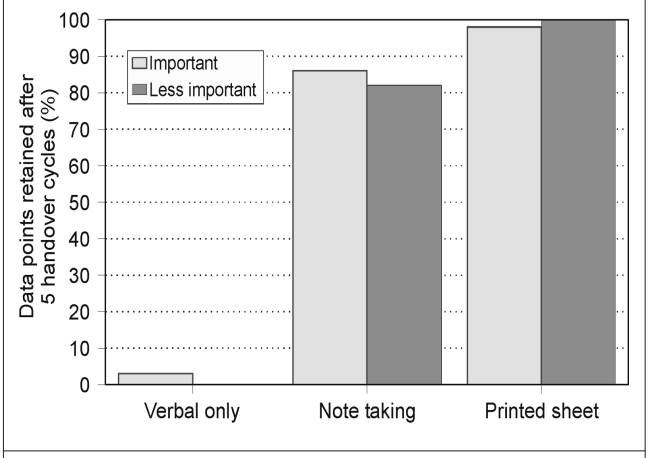

Figure 2 Percentage of data points (important and less-important) retained after 5 handover cycles.

important (3%) were handed over after 5 cycles, and none of the data points deemed less important were retained. In the note-taking group, 87% (55.5/64) of important data points and 81% (13/16) of less important data points were retained after 5 handover cycles. There was no significant difference between these proportions ($P > 0.05$).

Discussion

Our results demonstrate a wide variation in the efficacy of different handover styles. They show that the use of a pre-printed sheet vastly improves the amount of information retained during a handover. There are, however, some limitations to the design.

The experimental, rather than observational, nature of this study meant that it was carried out in an unrealistic environment. The handovers took place in a quiet room with no distractions or external stressors whereas, in a clinical setting, handover is often performed on a busy ward with frequent interruptions. However, had the study been conducted in such a clinical setting using real patients for handover, there may have been serious ethical issues with unacceptable data loss, especially with the 'verbal-only' group. As there was less discrepancy between the amount of data loss between the 'written' and 'printed sheet' groups, a follow-up observational study comparing these two methods may be helpful.

It is also the case that, in our study, a large number of data points were handed over by each participant. It can be argued that the participants were asked to remember much more detail about each patient than is expected in reality. On the other hand, no allowance could be made for any extra familiarisation with the patients that may have occurred during the course of the shift. Such large numbers were used to try to optimise the chance of exposing any variation in the efficacy of the different handover styles, and all of these biases were applied to all handover groups in a carefully controlled setting.

Overall, despite the discussion points alluded to above, our results clearly demonstrate a difference between the efficacies of the handover styles. They show that 'verbal alone' is not an effective handover method, and that the printed sheet method is the most effective way of retaining information. This then leads to the question of practicality of the printed sheet method of handover. Handover using a printed sheet is only ever going to be accurate if the sheet is regularly updated. This takes time and effort, and depends on the vigilance of the doctor on shift. The advent of IT-assisted documentation, pocket PCs and personal digital assistants may make this much less time consuming and the whole process more efficient.[6]

When receiving handover we might like to think that we are able to sift through the information to retain important clinical details above less important ones. However, our results show that important data points were lost in handover just as frequently as those deemed less important. Hence, even essential information that may result in serious morbidity could be lost if an inadequate method of handover is used.

Conclusions

The method of handover used to transfer patient information between doctors on shifts is of vital importance. The use of a verbal-only method is inadequate and prone to significant data loss. Whist the use of careful note-taking during handover vastly improves the amount of information retained, the use of a pre-printed sheet containing important patient details almost entirely eliminates data loss during handover. We recommend that all medical staff should seriously consider the use of pre-prepared data sheets, either printed or on screen, for the handover of their patients between shifts.

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