

Exploring the Potential of an Electronic Documentation System to Reduce Length of Stay

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Abstract and Objective

Electronic patient records are important in patient data management. Aim of this 2-year study was to investigate the effect of an e-documentation system on the ED length of stay. The study compared three length of stay parameters with and without the use of a prototype e-documentation system. 99 of trauma patients were monitored with the use of the electronic system and 101 patients (control group) were monitored with traditional methods. Time between the admission and completion of care was significantly lower in the e-documentation group (100±92 minutes, control group: 149±29 minutes). Similar effect was also found to the total ED length of stay (127±93 vs. 206±41 minutes) and time between completion of care and ED exit (26±10 vs. 57±23 minutes). LOS was reduced with the e-documentation system. This is important for the quality of trauma patient care, since saving time during the first hours after the accident usually determines the outcome of trauma patients.

Keywords: electronic documentation, emergency department, length of stay

Methods

In order to determine whether an electronic system based on clinical guidelines for trauma patient care can have positive effect to the ED length of stay, we developed a prototype in accordance with the international clinical guidelines of ATLS. Two groups of 99 and 101 trauma patients each were monitored during a 2-year period in an emergency department of a hospital in central Greece. The control group was monitored with the traditional process and the second group was monitored with the use of the prototype e-documentation system.

The pilot e-documentation system was developed with the use of open source software development tools: MySQL and Net-Beans and introduced the follow-up of ED cases using templates based on the main problem. For all cases there was gathered information about patient health status, trauma severity and the health outcome.

For each patient the following time parameters were calculated: (i) time between admission and completion of the planned care ($t_{\text{complete}} - t_{\text{arrive}}$) (ii) ED length of stay ($t_{\text{evac}} - t_{\text{arrive}}$) and (iii) time between completion of care and ED discharge ($t_{\text{evac}} - t_{\text{complete}}$). For each of the two trauma patient groups, the mean±sd values of the age, severity and the Glasgow Coma Scale (GCS) were calculated. The above variables were also compared to validate that the two groups do not differ significantly in terms of their age, severity and GCS.

Results

The patient control group age averaged 36.4 years (sd=18.1 years), while the mean age of the e-documentation group was

35.7 years (sd=20.2 years). For the GCS, the average score was calculated. The control group had an average score of 11.0 (sd=4.3), compared to an average of 10.7 (sd=4.3) for the e-documentation group. The two trauma patient groups were compared in terms of three time related variables. ED LOS was significantly lower for trauma patients monitored with the use of the e-documentation system (127±93 minutes) compared with the control group (206±41 minutes). Also, time between ED admission and completion of care was significantly lower for the e-documentation group (100±92 vs. 149±29 minutes). Finally, the time from the ED patient's completion of care, until they left the ED, to be transferred to other clinic, was also found to be significantly lower for the e-documentation group (26±10 vs. 57±23 minutes).

Conclusion

All three time related factors were found to be significantly lower for the e-documentation group. Results of the only other published study which quantifies the effect of an electronic health record on the ED length of stay have been different [1] but it is a fact that there are inadequate studies investigating the effect of electronic monitoring to the ED length of stay. Different environments have different ED LOS times, due to different settings and procedures[2] According to the literature, ED length of stay is a predictor of mortality[3]. There is also evidence of an association between length of ED boarding and outcomes[4].

To conclude, moving towards efficient and time effective electronic monitoring systems is expected to improve the quality of care, since it is evident that the first hours after the accident usually determines the outcome of patients.

References

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