Decreasing ED Length of Stay with Use of the Ottawa Ankle Rules Among Nurses

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Abstract:

ED crowding threatens patient safety and public health. Several studies have evaluated the ability of emergency departments in the United States to handle the demands that are being placed on them daily. ED crowding is widespread throughout the United States, with little evidence that the problem is being resolved. Emergency departments play a valuable role in the health care system because they act like a type of safety net.[1, 2] However, according to a recent report by the Institute of Medicine,[3] this safety net is at a point where it is no longer effective.

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Article:

ED crowding threatens patient safety and public health. Several studies have evaluated the ability of emergency departments in the United States to handle the demands that are being placed on them daily. ED crowding is widespread throughout the United States, with little evidence that the problem is being resolved. Emergency departments play a valuable role in the health care system because they act like a type of safety net.[1, 2] However, according to a recent report by the Institute of Medicine,[3] this safety net is at a point where it is no longer effective.

The potential dangers of ED crowding have become more visible as a result of recent reports on news broadcasts of unfortunate events regarding patients who were left unattended in waiting rooms. ED crowding refers to situations in which the number of patients in treatment areas exceeds the capacity of the department, thus leading to the treatment of patients in makeshift care areas or hallway beds.[4] Several surveys have discussed the implications of ED crowding. These surveys linked crowding to delays in diagnosis and treatment, a decrease in quality of care, and unacceptable patient outcomes.[5]

ED crowding has the potential to affect anyone who is injured suddenly or has an unexpected illness that requires urgent treatment. Nurses have opportunities to help alleviate overcrowding in the emergency department. With the implementation of protocols, emergency nurses may be able to play an active role in decreasing ED throughput time.

A system of rules has been developed to assist practitioners in identifying significant ankle fractures without the overuse of radiographic tests. These rules have been established as the Ottawa Ankle Rules (OARs).[6] Providers use these rules to determine if a radiograph is indicated in the evaluation of an ankle or foot injury. Emergency nursing staff can learn how to use the OARs to anticipate and treat patients with ankle and foot injuries. If the OARs indicate that a radiograph is needed, the nurse can order it according to protocols. It was hypothesized that implementation of a nurse-driven protocol to assess patients with non–life-threatening ankle and foot injuries with use of the OARs would result in a significant decrease in the total length of stay (LOS) in the emergency department.

Methods

A prospective study of ED LOS for patients with foot and ankle injuries before and after implementation of the use of the OARs among the emergency nursing staff was conducted. Institutional Review Board approval was obtained prior to implementation of this study (IRB-HSR No. 14682). The OARs and the protocol were taught and reinforced among the emergency nursing and physician staff. Staff members were able to use the rules to evaluate and treat patients who had sustained an ankle or foot injury. For the control group, data on patients with ankle and foot injuries were gathered from March 1, 2009, to April 30, 2009, prior to implementation of the protocol. The control group included 105 patients. For the treatment group, data were gathered on patients from January 1, 2010, to February 14, 2010. The treatment group included 100 patients.

The primary outcome variable was the total ED LOS (triage to discharge/admission). Data were obtained through a chart review within the electronic medical record for patients in the emergency department. Patients who had ankle or foot injuries and were older than 18 years were included in the review. Pediatric patients were excluded in this study. Data were analyzed with use of the Student *t* test, and $P < .05$ was considered significant. The total LOS for all ED patients during the control and treatment periods also was evaluated to identify factors other than the OAR intervention that may have affected LOS.

Results

During the control period, 9538 patients were seen in the emergency department, with an average LOS of 234 minutes. During the treatment period, 6297 patients were seen in the emergency department, with an average LOS of 242 minutes. The overall length of stay for all ED patients during the study period increased slightly, although this change was not statistically significant.

The time frame in which data were collected for the treatment period was longer, which may have been due to an increase in the number of snowstorms that were present in the geographic area. More patients had injuries that resulted from slipping or falling during the treatment period than during the control group period.

During the control group period, 105 patients had ankle and foot injuries that were appropriate for OAR protocol use among the nurses. The average LOS for these patients was 189 minutes ± 1 SD. During the treatment period, 100 patients had ankle and foot injuries that were appropriate

for OAR use. The average LOS for these patients was 144 minutes ± 1 SD. This difference was significant ($P < .030$).

During the control period, 33 patients sustained a fracture. During the treatment period, 34 total fractures occurred. Although the number of patients with a fracture did not change dramatically, the type of fracture did change. The type of fractures involved in the treatment period were overall more significant in their severity than during the control period, with a possibility of having a greater overall LOS for the treatment period compared with the control period. The LOS was still shorter in the treatment period, even though the fractures were more severe.

Limitations

The project had several limitations. First, not all of the nursing staff were trained in the use of the OARs. Although every attempt was made to provide training, just over half of the total nursing staff received personal training. Several e-mail messages were sent to the entire ED staff to alert them to the OARs and how to use them. These e-mail messages were sent in an attempt to reach the staff who were not able to have personal instruction in the use of the OARs. Personal instruction included teaching the OARs during a face-to-face encounter.

Second, the decrease in LOS may be attributed to other policies or strategies being implemented to decrease throughput within the emergency department. Such changes may have been implemented by the consulting orthopedic doctors. For example, the orthopedic department may have changed a protocol or done things in a different way at the same time that the intervention was being implemented, or this department may have had an increase in the number of consulting staff available. These factors would have the potential to affect the general throughput of the emergency department. However, it did not appear that any major policy changes took place either within the emergency department or outside the emergency department during the time the study was being conducted.

Third, the nursing staff may have implemented the OARs more quickly than they would have done otherwise because of the presence of the nurse practitioner (NP) who was conducting the study. The nursing staff may have used the OARS while the NP was present and not used the OARS when the NP was not present. Thus a type of Hawthorne effect may have occurred; if so, the results might be short-lived after completion of the project.

Implications

This project demonstrated that when nurses use the OARs, a significant reduction in total ED LOS can be reached for patients with ankle and/or foot injuries. As waiting times decrease, an increase in patient satisfaction and comfort may occur as treatment and comfort measures are applied in a more timely manner. The decreased LOS and shorter waiting times also have the potential to increase staff satisfaction and job performance.

With this finding in mind, other protocols can be developed, studied, and implemented among nursing staff to further decrease the total LOS for patients in the emergency department. As this

process is completed, a decrease in other complications that arise from longer ED waiting times and overall LOS may occur.

An unintended implication of this project was related to the attending physicians and other providers. Having nurses order radiographs when indicated by the OARS saved time for the providers, because they did not have to order the radiograph themselves and then return to evaluate it once the patient returned from radiology. Thus the attending physicians and other providers could see the patient just once and had all the necessary information to determine if a fracture or a different type of ankle/foot injury had occurred and to treat it accordingly.

Conclusion

The results of this project support findings within the literature that an increased use of nurse-sensitive protocols decreases ED LOS by improving throughput. With use of the OARs among nurses, a decrease of 45 minutes in the overall LOS of patients with ankle or foot injuries occurred.

The LOS data were evaluated for all patients seen in the emergency department during the control and study period to ensure that the observed decrease in LOS was not due to other ED factors unrelated to the study intervention. LOS during the control period was slightly shorter for all ED patients than it was during the treatment period, although this difference was not statistically significant. Thus it was concluded that the decrease in LOS observed in the study population was very likely due to use of the OAR among nurses within the emergency department.

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