Direct to OR Resuscitation: A Reevaluation 20 Years After Implementation at LVHN.

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Introduction/Background

Unlike many other level 1 trauma centers in the country, Lehigh Valley Health Network utilizes a complex triage system designed to direct those trauma patients that are most likely to need operative intervention immediately into the trauma operating room for resuscitation. Operating Room Resuscitation (ORR) is an expensive practice which has been perceived as unnecessary by a group of individuals intimately involved in the trauma cases affected. This practice, in theory, prevents loss of valuable time triaging the patient and facilitates quicker initiation of lifesaving care to the most severely injured patients. The opinion expressed by some physicians involved in trauma care at LVHN is that the current system results in an excessive number of overtriages to ORR which result in unnecessary allocation of resources and personnel time. The current problem is that these are still just subjective opinions which need to be justified by clinical evidence before any change can be made to the current system.

Problem Statement

Direct to Operating Room Resuscitation (ORR) at LVHN incurs significant cost beyond that of trauma triage, and subjectively does not improve patient outcomes. The goal of the study is to reevaluate the morbidity and mortality associated with ORR and upgrade to OR (or Code Red) from trauma triage.

Methods

- Literature review to determine presence and practice of trauma triage across the US
- Outcomes data collected retrospectively from LVHN trauma database
- All adult patients treated by trauma service as either ORR or upgrade to Code Red from January 1, 2008 to December 31, 2008
- Patient age, GCS on admission, Hospital LOS, ISS, Percent which required operative intervention

Results

- Avg Age: Upgrade: 55.15, ORR: 37.30 (p-value 0.001)
- Avg GCS: Upgrade: 10.54, ORR: 10.25 (p-value 0.859)
- Percentage Mortality: Upgrade: 30.77%, ORR: 25.23% (p-value 0.669)
- Avg LOS: Upgrade: 14.0 days, ORR: 11.53 days (p-value 0.651)
- Avg ISS: Upgrade: 27.15, ORR: 20.89 (p-value 0.294)
- Percentage Resulting in Operative Intervention: Upgrade: 69.23%, ORR: 65.77% (p-value 0.805)

Mechanism of Action

- Upgrade from Trauma Triage
  - Ground Fall
  - Fall from Height
  - MVA
  - MCA
  - Blunt

- Direct to OR
  - Ground Fall
  - Fall from Height
  - MVA
  - MCA
  - Blunt

Operations Performed

- Upgrade from Trauma Triage
  - Exploratory Laparotomy
  - Exploratory Laparoscopy
  - Wound Debridement
  - Ortho Procedure
  - Neurosurgical Procedure

- Direct to OR
  - Exploratory Laparotomy
  - Exploratory Laparoscopy
  - Wound Debridement
  - Ortho Procedure
  - Neurosurgical Procedure

Conclusions and Future Implications

Overall, those patients that were upgraded to code red from trauma triage appeared initially worse off, with worse ratings for GCS and ISS, longer LOS, and higher % mortality, however none of these proved statistically significant. The upgraded patients had a higher percentage that resulted in operative intervention however this was also not statistically significant. The lack of statistical significance associated with any of these parameters demonstrates that there is no significant difference in the initial status of patients between groups as well as no difference in mortality or necessity of operative intervention. Mechanism of injury was more commonly penetrating in the ORR group reflecting that EMT decision making trends. Because resource allocation is so important in the healthcare system, this finding can potentially save a large health system from expending valuable resources and personnel time that could be better spent elsewhere. This foundation of evidence can be used to support discussions about going from a direct to ORR model to all trauma triage with subsequent upgrade to code red when appropriate.

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