THE EFFECT OF EMERGENCY DEPARTMENT LENGTH OF STAY ON CLINICAL OUTCOMES FOR CRITICALLY ILL OR INJURED PATIENTS

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INTRODUCTION OF THE PROBLEM

❖ Emergency departments are designed to provide emergent stabilization and initial therapy for critically ill or injured patients.

❖ Emergency departments do not have the resources or physical space to provide longitudinal critical care (1:1 RN to patient ratio & critical care intensivist).

❖ Overcrowding in the ED is a national problem.

❖ ED visits are 123 million/year which represents an increase of 20% (2008).

BACKGROUND

❖ Nursing has a critical role in patient safety

❖ ED is a high risk environment that threatens patient safety (risk for omissions, delays, and errors)

❖ As the volume of patients increases, the RN to patient ratio increases.

❖ 150 days of critical care time provided in the ED

❖ Emergency nurses are trained to provide varying levels of care from critical care to preventive care. Critical care nurses receive specialized training to care for critically ill or injured patients

BACKGROUND

* Chaflin et al. (2007) concluded that delayed transfers (> 6 hrs) to critical care unit increased LOS and mortality.
* Mowery et al. (2011) concluded that a longer ED LOS is associated with increased hospital mortality.
* Carr et al. (2007) concluded for each hour in the ED increased the risk of developing pneumonia by 20%.
* Clark & Normile (2007) concluded that timeliness to first medication and order for ICU influenced both ED and hospital LOS.
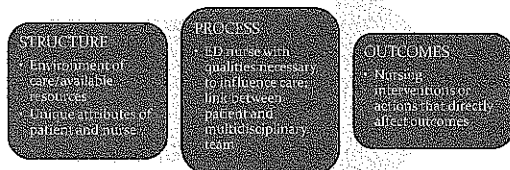
DUFFY'S QUALITY-CARING MODEL©

STRUCTURE
* Environment of care/available resources
* Unique attributes of patient and nurse

PROCESS
* ED nurse with qualities necessary to influence care; link between patient and multidisciplinary team

OUTCOMES
* Nursing interventions or actions that directly affect outcomes

PURPOSE OF THE STUDY

* The purpose of this study was to correlate the effects of the Emergency Department length of stay and clinical outcomes in critically ill or injured patients as measured by the mortality rates and nursing-sensitive indicators (VAPs, CLABSIs, and late or failure to rescue rates).

METHODOLOGY

❖ *Study Design:* Quantitative, retrospective, non-experimental analysis of patients admitted to the critical care unit from the emergency department.

❖ *Study Setting:* 752 bed regional referral center in Western North Carolina

❖ *Study Population:* Patients admitted from the ED to critical care units.

  ❖ *Excluded patients:* < 18 years of age, patients who died within 24 hours of admission, DNR patients, patients transferred to the OR, cath lab, or interventional radiology prior to ICU

METHODOLOGY

❖ *Data Collection:* Data abstracted from APACHE II database, Trauma Registry, and ED logs and entered into Excel spreadsheet.

❖ *Study Period:* January 2010 to December 2010

❖ *Data Analysis:* Descriptive statistics using the statistical program Minitab, version 16.

RESULTS

❖ 1520 patients in the study

  ❖ 1681 patients entered into database

  ❖ 152 patients excluded based on exclusion criteria

  ❖ 9 patients were entered twice in the database

RESULTS
PATIENT CHARACTERISTICS

Gender	Age-yrs (average)	ED LOS (Mean)	ICU LOS (Mean)	Hospital LOS (Mean)	Total (n= xxx)
Males	58.5 years	5.831 hours	3.432 days	8.808 days	802 pts
Females	63.7 years	6.537 hours	3.111 days	7.905 days	718 pts

RESULTS
❖No significant relationship between ED LOS and overall hospital LOS
❖Significant but extremely weak negative relationship between the ED LOS and ICU LOS
❖Mean ED LOS-6.16 hours
❖Mean ICU LOS-3.28 days
❖Mean hospital LOS-8.38 days

RESULTS
ACUITY AND LOS

Acuity Scale	Number of Patients	Mean Length of Stay (hrs)	Standard Deviation
CTAS-1	147	4.213 hrs	2.477
CTAS-2	741	5.877 hrs	2.676
CTAS-3	557	7.211 hrs	2.754
CTAS-4	23	7.582 hrs	2.715
CTAS-5	3	6.660 hrs	3.007

Statistically significant relationship between acuity and ED LOS, $p < 0.001$

RESULTS
DIED IN THE ICU

ED Length of Stay Category	Number of Deaths	Total # of Patients in Sample	Percentage of Patients
0-3 hours	8	175	4.5%
3-6 hours	46	607	7.5%
6-9 hours	19	517	3.6%
>9 hours	11	221	4.9%

•Total ICU deaths=84 pts
•No significant relationship between male and female deaths (p = 0.753)
•Patients in the ED 3-6 hours had a statistically significant higher death rate than other ED length of stay ranges (p = 0.033)

RESULTS
DIED IN NON-ICU HOSPITAL UNIT

ED Length of Stay Category	Number of Deaths	Total Number of Patients in Sample	Percentage of Patients
0-3 hours	8	175	4.5%
3-6 hours	27	607	4.4%
6-9 hours	30	517	5.8%
>9 hours	8	221	3.6%

•Total non-ICU hospital unit deaths = 73
•No statistically significant difference for patients who died in the non-ICU hospital unit and ED LOS (p = 0.206)
•No statistically significant difference whether the patient died in the ICU or a non-ICU unit (p = 0.367)

RESULTS
ISS & APACHE II SCORES

❖ Higher injury severity scores (ISS) had longer hospital and ICU length of stays with a weak relationship between the higher ISS and ED LOS (p = 0.007)
  ❖ ISS = Injury Severity Score is an anatomical scoring system that provides an overall score for those who are injured
❖ Higher APACHE II scores had longer ICU length of stays with no significant relationship between APACHE II score and ED LOS (p = 0.620)
  ❖ APACHE II =Acute Physiology and Chronic Health Evaluation score that includes physiologic measurements, age, and previous health status

RESULTS
CLABSIs and VAPs

- ❖ No central line associated bloodstream infections were associated with those patients admitted to ICU from the ED (12,156 central line days)
- ❖ Five patients developed ventilator associated pneumonia. There was a statistically significant relationship between the emergency department and VAP rates ($p = 0.042$)

RESULTS
DISPOSITION of PATIENTS

- ❖ 69.34% home
- ❖ 5.2% rehab facility
- ❖ 1.32% long term acute care hospital
- ❖ 8.29% skilled nursing facility
- ❖ 2.04% psychiatric facility
- ❖ 0.79% hospital closer home
- ❖ 0.59% hospice facility
- ❖ 0.13% assisted living
- ❖ 1.97% other
- ❖ 10.33% death

RESEARCH QUESTION

The researcher proposed to answer the question:

"Does the emergency department length of stay affect clinical outcomes for critically ill or injured patients?"

CONCLUSIONS

❖ *Interpretation of Findings:*

  ❖ Patients designated CTAS- 1 had the shortest length of stay.
  ❖ Patients who stayed in the ED 3-6 hours had a greater mortality rate than those who stayed greater than 6 hours or longer. This suggested those patients may be under triaged and/or under-resuscitated.
  ❖ Patients intubated in the ED had a greater rate of ventilator associated pneumonia. This suggested preventive strategies to decrease VAP may not implemented.
  ❖ Female patients had a longer ED LOS. This suggested female patients could be under-triaged due to gender bias and beliefs that females do not present their symptoms objectively.

CONCLUSIONS

❖ *Implications for Nursing:*

  ❖ Initiate, cultivate, and sustain caring relationships with the patients and other health care providers
  ❖ Provide critical care nursing regardless of patient location
  ❖ Institute early best practices such as the ventilator bundle

❖ *Limitations:*

  ❖ Conducted at one hospital
  ❖ Unable to determine hospital occupancy rates, staffing patterns, and the possible lack of available resources
  ❖ Unable to determine late or failure to rescue rates

CONCLUSIONS

❖ *Implications for Further Research:*

  ❖ Analysis of subgroup of patients who were admitted from the ED to non-ICU and then transferred to the ICU within 12 hours
  ❖ Monitoring performances, competencies and staffing patterns as related to outcomes
  ❖ Nursing-sensitive indicators as related to clinical outcomes

QUESTIONS?

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