Demographics of Patients Experiencing a Rapid Response Team Code Shortly After Emergency Department Transfer

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Introduction

- Diagnostic errors are common in the emergency room setting due to high patient volume and early-onset in the diagnosis process[1]
- Patients admitted through the ED that experience a diagnostic error are more likely to have increased length of hospital stays and increased mortality[2]
- Increased rates of diagnostic error are speculated to be a byproduct of poor handoffs surrounding transfers from the ED to the inpatient unit[3]
- Previous research on patient populations have reported women and those over 65 had increased risk of experiencing a diagnostic error [4,5]
- In another study, non-Hispanic black children were less likely to undergo imaging and thus had delayed diagnosis of appendicitis when compared to non-Hispanic white children[6].
- Research has suggested potential methods to measure rates of diagnostic error including use of trigger tools and reports from patients and physicians[7]
- Rapid Response Team (RRT) is a measure of worsening in condition that can be input into an electronic trigger tool, a system designed to provide easy-to-use clues to identify adverse events[8]
- In a 2009 study, researchers found 23 adverse events in 65 cases (35%) of RRT within a four-week period[9]

Aims and Objectives

1. Determine the frequency of Rapid Response Team in patients shortly after transition from the emergency department to a hospital medicine unit. The activation of a will be used as a marker for decompensation.

2. Describe the demographic characteristics of patients who are at risk of diagnostic error shortly after a transition-of-care.

Methods

Study Design
- Retrospective chart review of patients admitted to an inpatient medicine unit through the ED in the year of 2019
- Patients were grouped into those who had an RRT called within 24 hours of transfer and those who did not
- Data was analyzed to determine if different demographic groups are at higher risk of experiencing an RRT code after transfer

Study Participants
- Inclusion: Patients 18 years of age and older. Patients transferred from the ED to an inpatient medicine unit between the study dates of January 1st, 2019 through December 31st, 2019. Patients who underwent an RRT code within 24 hours of the transfer.
- Exclusion: Patients under the age of 18. Patients transferred to non-medicine units (e.g., ICU)

Variables of Interest

Presence and type of diagnostic error
Race
Ethnicity
Sex
Sexual Orientation
Age
Insurance (Private, Medicare, Medicaid, None)
Income (determined by average household income of home zip code)
Inpatient Unit of Transfer/ Unit Admitted to

Table 1. Demographic data collected.

Statistical Analysis
- Using a Chi-Square test, we compared those who had an RRT call to those who did not. The level of statistical significance was set at $p < .05$

Results

- In 2019, there were approximately 18,719 transfers from the emergency department to an inpatient medicine unit of progressive or normal acute care
- Of these patients, 3840 had an RRT code called within 24 hours following transfer

Results (cont.)

- There were more females admitted with a total of 9960 (Table 2)
- Out of the 3840 RRT codes, 55% were for female patients (2130 out of 3840), a statistically significant difference with $p < .01$

Percentage of RRT In Females and Males

Sex	RRT	Total (n)
Female	2130 (21%)	9960
Male	1710 (20%)	8759

Table 2. Percentage of RRT out of all females and males.

- Across age groups, the percentage of patients who required an RRT within 24 hours increased with age (Table 3), an overall significance with $p < .01$
- Of those patients who were 80 and older, 25% experienced an RRT. Out of the RRT codes ordered, 32% were for patients 80 and older (1223 out of 3840)

Percentage of RRT Across Age Groups.

Age	RRT	Total (n)
18-29	112 (14%)	795
30-39	148 (13%)	1113
40-49	200 (14%)	1458
50-59	429 (18%)	2448
60-69	724 (19%)	3726
70-79	1004 (24%)	4201
80+	1223 (25%)	4978

Table 3. Percentage of RRT by age group out of the total number of patients within that age group at the time of transfer to inpatient.

- The highest was 23% of Black or African American patients experiencing an RRT. This patient population had 30% of the RRT codes, but only made up 26% of all patients included during this one-year period
- There was an overall significant difference of $p < .01$

Percentage of RRT Across Racial Groups.

Race	RRT	Total (n)
American Indian or Alaska Native	8 (15%)	54
Asian	71 (19%)	377
Black or African American	1110 (23%)	4858
Native Hawaiian/Pacific Islander	2 (17%)	12
Other	138 (18%)	765
White or Caucasian	2511 (20%)	12653

Table 4. Percentage of patients within recorded races that had an RRT called.

Conclusions

- Historically marginalized patient populations had higher percentages of patients experiencing an RRT
- Older adults may present with more complicated clinical cases that require increased consideration when considering a medical diagnosis
- Rates of RRT may be higher in certain groups because their clinical needs are not recognized as early. For example, if a missed diagnosis is made, the patient may experience clinical deterioration, thus requiring the need for an RRT
- Clinicians may experience biases that increase the risk of a missed, delayed, or misdiagnosis
- Providers within the hospital need to be aware of possible biases they may have that prevent them from making an accurate diagnosis

Future Directions
- Further analysis of demographic data to determine if there were higher rates of of RRT codes, for example, in uninsured individuals
- Chart reviews of physical exam findings, orders, and other clinical clues to determine if diagnostic errors were made in cases where an RRT was called

Limitations
- Large sample size suggests there may be a statistically significant difference that is not clinically significant

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