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Data and Edits in Healthcare Information Management

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Abstract- This studydetermine which job function causes or creates a large number of Edit/ Data Overwrites within health care. The study is based on data extracted from the Monthly Reports reported by the Team staff. Out of the 2736 Potential Identity Changes, 115 actually resulted in a CE. The number of CEs created by each job title ranged from 1% by Employee Health Clerk to 28% by Eligibility Clerk. Out of the 115 CEs created, a total of 32 were created by the Eligibility Clerks. The next highest job title was the Enrollment/Registration Clerks with 21 CEs created. Of the 4% of CEs reported, Eligibility Clerks created 28% of those CEs and Enrollment/Registration Clerks created 18% of CEs reported during this time period. The findings provide insight to thestaff as well as other managers for the users who need additional training or realignment in the workflow. Further work is required to expand and identify factors contributing to incidents causing CEs.

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I. Data and Edits in Healthcare Information Management

There has been a significant increase in the number of occurrences of catastrophic edits to patient identity traits. Catastrophic Edit (CE) are changes to a patient's electronic health record that result in the record being changed to that of another patient, caused by, but not limited to, edits to patient identity data (such as name, Social Security Number (SSN), date of birth, gender) and/or erroneous merging of two or more distinct patient records into a single record.

While monitoring the changes, it has beendiscovered a recurring issue of catastrophic edits to patient identity traits. These edits are often a result of an inappropriately editing of an existing record through mis-selection or error. These errors can affect administrative, clinical, and billing processes as well as affect patient care causing a significant patient safety risk.

The purpose of this study is to investigate the role (job title) of the originator of the Catastrophic Edits/Data Overwritesto identify the correlation between the role and the number of Catastrophic Edits. The objective of this study is to determine which job function causes or creates a large number of Catastrophic Edits/ Data Overwrites.

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II. Background

There are several studies and researches conducted that focuses on the patient safety incident involving human computer related incidents. Magrabi, Ong, Runciman, & Coiera's (2010) conducts a descriptive analysis to examine computer related patient incidents across one Australian state. Ash, Berg&Coiera, 2003 draws on a series of qualitative research studies in the US, the Netherlands and Australia with ethnography observation in healthcare setting and semi-structured interviews with health professionals.

Magrabi, Ong, Runciman, & Coiera (2010) searched 42616 patient safety events incident reported 2003 to 2005 by public hospital clinician to the Advanced Incident Management System. They examined 123 incidents that were computer related incident. Of the 123 incidents retrieved, four duplicates and eight incidents that did not relate to patient safety were removed, leaving 111 incidents. Of the 111 incidents, eight were described as an improvement in patient safety due to Information Technology (IT) and four were unresolvable, leaving 99 incidents. Information input issues accounted for the largest category with 31% of the incidents. These issues included were related incorrect human data entry such as incorrect selection of patient and typographical errors. Information output data accounted for 20% of incidents, which included problems with human-computer interaction such as error in interpreting, printed information due to poor quality or data retrieval errors (Magrabi, Ong, Runciman, & Coiera, 2010).

Ash, Berg and Coiera (2003) discussed errors in the process of entering and retrieving information in or from the system based on ethnographic observations and semi-structured interviews with healthcare professionals. They discussed in detail the problem of a human-computer interface that is not suitable for a highly interruptive use context. By health care professional often being interrupted by patients, telephones and other colleagues, the mismatch between interface and use context often resulted in a juxtaposition error. A juxtaposition error is an error caused when something is close to something else on the screen and the wrong option is too easily clicked in error (Ash, Berg and Coiera, 2003). The authors found there were instances of patient confusion when orders were entered for the wrong patient. They also found that

overly structure data entry led to a loss of cognitive focus. The use of many screens or need to switch between screens results in error.

III. Methods

This study examined Catastrophic Edits (CEs) reported by team staff between November 2011 through December 2012. Due to privacy and security policies, the sites and CEs have been de-identified. The role or functional job title of the medical center staff who createdthe CE options consists of the following job titles: Administrator of the Day (AOD), Clinic Clerk, Clinical (Medical/Surgical) Staff, Eligibility Clerk, Employee Health Clerk, Enrollment/ Registration Clerk, Health Eligibility Center (HEC) Staff, Point of Contact (POC), Personnel/Human Resources (HR) Clerk, Privacy Officer, Supervisors, Ward Clerk and Other. The options for how the CE occurred include: Manual, Primary View Updates, Catastrophic Merge, Upload, and unknown, Mismatch/Auto Link.

The data collected from the Monthly CE Reports was compiled using Microsoft Excel. The data was extracted and entered in separate MS Excel worksheets. The data extracted was entered in MS Excel worksheets and categorized by titles of the originator, sites, and how the CE occurred. The number of CEs created and the job title of the creator of the CE were calculated and a bar graph was formulated to identify the actual number of CEs created by each job title. The number of CEs were calculated and a bar graph was formulated to identify the number of CEs. The number potential CEs calculated against the number of actual CEs each month was charted and a bar graph was formulated to compare the potential CEs vs. the actual CEs.

IV. Results

From November 2011 to December 2012, a total of 2736 Potential Identity Changes occurred. Out of the 2736 Potential Identity Changes, 115 actually resulted in a CE (Table 2). Table 3 shows the job title of the CE originator in ascending order by the number of CEs created. The number of CEs created by each job title ranged from 1% by Employee Health Clerk to 28% by Eligibility Clerk. Out of the 115 CEs created, a total of 32 were created by the Eligibility Clerks. The next highest jobtitle was the Enrollment/Registration Clerks with 21 CEs created. The MPI POCs and the other job title ranked close with MPI POCs creating 15 CEs and Other creating 16 CEs. The Employee Health Clerks created the lowest number of CEs with 1 CE created followed by the AOD with 2 CEs and Regional Office Staff with 3 CEs. There is a significant difference between the job titles which created the highest number of CEs created compared to the job title which lowest number of CEs.

Table 2 : Total Potential ID Change and Edits

	Total Potential ID Changes	Total Catastrophic Edits
	80	10
	87	8
	90	9
	82	8
	92	4
	103	12
	100	6
	359	8
	344	13
	352	8
	715	4
	158	5
	79	17
	95	3
Total	2736	115

Table 3 : Job Title of Edits Originators

TITLE OF CE ORIGINATOR	CEs Created	% of CEs Created
Admin Officer of the Day (AOD)	2	2%
Clinic Clerk	8	7%
Clinical (Medical/Surgical) Staff	4	3%
Eligibility Clerk	32	28%
Employee Health Clerk	1	1%
Enrollment/Registration Clerk	21	18%
Health Staff	6	5%
MPI	15	13%
Other	16	14%
Supervisor	7	6%
Regional Office Staff	3	3%
Total	115	

V. Discussion

In this study various tools were used to examine the role or functional job title of the medical center staff that created the CE on the MPI. The findings reveal that out of the number Potential Identity Changes, 4% actually resulted in a CE, which is considered relatively high compared to the medical staff's goal of creating less than 1% of CEs. This study found that the job titles with the highest occurrence of CEs are Eligibility Clerks and Enrollment/Registration Clerks.

There wereseveral limitations to this study.These finding may be less applicable to other health care institutions or users that edits data within records. Another limitation was in cases where the job title of the CE was undetermined or unknown, the CE was documented and counted in the "Other" section for this study. This may have caused underrepresentation of the job title of the user who created the CE.Lastly, the Catastrophic Edit report used to examine the CEs that have occurred may contain errors or inaccuracies in documentation.

VI. Conclusion

Of the 4% of CEs reported, Eligibility Clerks created 28% of those CEs and Enrollment/Registration Clerks created 18% of CEsreported during this time period. Eligibility Clerks and Enrollment/Registration clerks work in a high traffic multifunctional work environment that results in errors caused by mis-clicking, interruptions, entering and retrieval of wrong patient. According to Magrabi, Ong, Runciman & Coiera, most information input problems were associated incorrect data entry such as incorrect selection of the patient name, data entry in incorrect fields and typographical errors. Factors reported included lack of training, failure to carry out a duty, high cognitive workload and effects of multitasking (2010). The findings of this study produced useful information about the users to which yieldsto further research with identifying various causes of CEs.Since this study did not evaluate the actual causes of the CEs, further work is required to expand and identify factors contributing to incidents causing CEs.

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Table 1: Edits Reports

VISN	HOW CE OCCURRED (Manual, etc.)	TITLE OF CE ORIGINATOR
F	Manual	Admin Officer of the Day (AOD)
F	Manual	Admin Officer of the Day (AOD)
H	Manual	Clinic Clerk
H	Manual	Clinic Clerk
I	Manual	Clinic Clerk
J	Manual	Clinic Clerk
J	Manual	Clinic Clerk
L	Manual	Clinic Clerk
L	Manual	Clinic Clerk
U	Manual	Clinic Clerk
G	Manual	Clinical (Medical/Surgical) Staff *
K	Manual	Clinical (Medical/Surgical) Staff *
U	Manual	Clinical (Medical/Surgical) Staff *
V	Manual	Clinical (Medical/Surgical) Staff *
A	Manual	Eligibility Clerk

A	Manual	Eligibility Clerk
A	Manual	Eligibility Clerk
A	Manual	Eligibility Clerk
D	Manual	Eligibility Clerk
F	Manual	Eligibility Clerk
F	Manual	Eligibility Clerk
G	Manual	Eligibility Clerk
G	Manual	Eligibility Clerk
G	Manual	Eligibility Clerk
G	Manual	Eligibility Clerk
H	Manual	Eligibility Clerk
H	Manual	Eligibility Clerk
I	Manual	Eligibility Clerk
I	Manual	Eligibility Clerk
I	Manual/Mismatch	Eligibility Clerk
K	Manual	Eligibility Clerk
P	Manual	Eligibility Clerk
P	Manual	Eligibility Clerk
P	Manual	Eligibility Clerk
P	Manual	Eligibility Clerk
Q	Manual	Eligibility Clerk
Q	Manual	Eligibility Clerk
R	Manual	Eligibility Clerk
R	Manual/Mismatch	Eligibility Clerk
R	Manual	Eligibility Clerk
S	Manual	Eligibility Clerk
T	Manual	Eligibility Clerk
T	Manual	Eligibility Clerk
T	Manual	Eligibility Clerk
U	Manual	Eligibility Clerk
V	Manual	Eligibility Clerk
T	Manual	Employee Health Clerk
C	Manual	Enrollment/Registration Clerk
C	Manual	Enrollment/Registration Clerk
D	Manual	Enrollment/Registration Clerk
D	Manual	Enrollment/Registration Clerk
F	Manual	Enrollment/Registration Clerk
F	Manual	Enrollment/Registration Clerk
G	Manual	Enrollment/Registration Clerk
H	Manual	Enrollment/Registration Clerk
H	Manual	Enrollment/Registration Clerk
H	Manual	Enrollment/Registration Clerk
H	Manual	Enrollment/Registration Clerk
H	Upload	Enrollment/Registration Clerk
I	Manual	Enrollment/Registration Clerk
J	Manual	Enrollment/Registration Clerk
L	Manual	Enrollment/Registration Clerk
O	Manual	Enrollment/Registration Clerk
P	Manual	Enrollment/Registration Clerk
T	Manual	Enrollment/Registration Clerk
U	Manual	Enrollment/Registration Clerk
W	Manual	Enrollment/Registration Clerk
R	Manual	Enrollment/Registration Clerk (DoD)
G	Manual	HEC Staff
G	Manual	HEC Staff
G	Manual	HEC Staff
G	Manual	HEC Staff
G	Manual	HEC Staff
G	Manual	HEC Staff

C	Manual	MPI POC
C	Manual	MPI POC
D	Manual	MPI POC
G	Manual	MPI POC
G	Manual	MPI POC
J	Manual	MPI POC
K	Catastrophic Merge	MPI POC
K	Manual	MPI POC
P	Catastrophic Merge	MPI POC
R	Manual	MPI POC
R	Manual	MPI POC
T	Manual	MPI POC
T	Manual	MPI POC
T	Manual	MPI POC
W	Manual	MPI POC
A	Manual	Other *
D	Manual	Other *
G	Mismatch/Auto-Link	Other *
I	Manual	Other *
P	Manual	Other *
P	Upload	Other *
P	Upload	Other *
P	Upload	Other *
P	Upload	Other *
P	Upload	Other *
P	Upload	Other *
P	Upload	Other *
P	Upload	Other *
P	Upload	Other *
P	Upload	Other *
U	Manual	Other *
A	Manual	Supervisor
G	Manual	Supervisor
K	Manual/Catastrophic Merge	Supervisor
T	Manual	Supervisor
U	Manual	Supervisor
W	Manual	Supervisor
W	Manual	Supervisor
J	Manual	Regional Office Staff
T	Manual	Regional Office Staff
W	Manual	Regional Office Staff