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The Relationship of Trauma Readmissions and Insurance Status: Does it Matter?

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Purpose: Unplanned hospital readmissions in trauma patients, in relation to insurance status, are under-explored. This study tests the hypothesis that patients readmitted following a traumatic injury are publically insured and over the age of 65 years.

Methods: The data in this study were collected retrospectively from an urban, Level I trauma center between January 1, 2003 and June 30, 2015 and contains patient encounters obtained from Dallas-Fort Worth Hospital Council (DFWHC). A binary logistic regression of the dichotomous dependent variable readmission was performed ($\rho < 0.05$, 95% confidence interval).

Results: A total of 28,979 encounters and 21,231 patients were analyzed. The overall rate of any readmission was 42.2%. Of the 28,979 total encounters, 21,556 encounters consisted of individuals aged 64 years or younger and 7,423 encounters consisted of individuals aged 65 years or older, with readmission rates of 35.2% and 62.6%, respectively ($p < 0.000$). Of the readmission encounters, 41% were insured through Medicare, 22% were uninsured, 28% were privately insured, and 9% were insured through Medicaid. Falls were found to be the number one cause (29%) of readmissions in this population, with severe sepsis as the number one co-morbidity ($OR=9.46$, $\rho < 0.000$).

Conclusion: This study confirmed our hypothesis and found that older individuals, specifically over the age of 65 years, with Medicare insurance are more likely to be readmitted following traumatic injury and characterized by their vulnerability and tendency to fall. This data highlights the need for hospital-centered education focused towards the elderly population.
THE RELATIONSHIP OF TRAUMA READMISSIONS AND INSURANCE STATUS: DOES IT MATTER?

Anil A. Shalwani

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Dean, Graduate School of Biomedical Sciences
THE RELATIONSHIP OF TRAUMA READMISSIONS AND INSURANCE STATUS: DOES IT MATTER?

INTERNSHIP PRACTICUM REPORT

Presented to the Graduate Council of
Biomedical Sciences University of North Texas Health Science Center at Fort Worth
in Partial Fulfillment of the Requirements
For the Degree of

MASTERS OF SCIENCE IN CLINICAL RESEARCH MANAGEMENT

By

Anil A. Shalwani
Fort Worth, Texas

Date of defense November 11, 2015
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CHAPTER I
INTRODUCTION

Since the introduction of the Hospital Readmissions Reduction Program in 2012, or section 3025 of the Affordable Care Act, the Centers for Medicare & Medicaid Services (CMS) have been required to reduce the amount of payments made to hospitals that have an increase in readmission rates related to acute myocardial infarction (AMI), heart failure (CHF), and pneumonia (PNA) (Centers for Medicare and Medicaid, 2014). Other conditions that have been included in this plan for fiscal year 2015 include: chronic obstructive pulmonary disorder (COPD), total hip arthroplasty (THA), and total knee arthroplasty (TKA) (Centers for Medicare and Medicaid, 2014). It has been speculated that these payment reductions to hospitals due to readmissions will eventually include trauma-related injuries. In fact, as of February 2014, traumatic injuries account for 30% of all life years lost, i.e., the time a person could have lived if he or she did not have a premature death (Gardner and Sanborn, 1990) in the United States, and is responsible for an economic burden of $585 billion a year, including health care costs and lost productivity (National Trauma Institute, 2014).

Previous factors that have been examined to determine which ones are correlated with increases in hospital readmissions include comorbidities, length of stay, injury severity score and insurance information (Morris et al., 2014). Some studies claimed that insurance type plays a role in hospital readmissions, however very few studies have focused solely on investigating insurance type (Gabayan et al., 2013; Bieler et al., 2012). In addition, other studies have focused
solely on a population aged 65 years and older (Kates, Behrend, Mendelson, Cram, and Friedman, 2015; Rittenhouse et al., 2015). To better address these determining factors of hospital readmissions, this practicum project and study analyzed the data collected from three separate groups of subjects: one including patients 18 years and older, one ranging from only 18-64 years old, excluding patients 65 years and older, and one including patients 65 years and older. By doing so, insurance status can be contrasted across these three age groups to determine whether public insurance mediates hospital readmissions. Although this practicum study aims to determine if insurance status is correlated with readmission in trauma patients, this study also tested whether other factors, such as comorbidities and infection, could be potential predictors of readmission.

This study will test the hypothesis that trauma readmission patients are more likely to be publically insured, and that there will be a significant difference in insurance status between the total sample versus the sub-sample that excludes individuals 65 years of age and older versus the sub-sample that only includes individuals 65 years of age and older. Additionally, it is hypothesized that multiple other factors will be identified that contribute to readmission rates, with infection and comorbidities being the most prevalent causes.
CHAPTER II
RESEARCH PROPOSAL

Background

Insurance status has been shown to have an effect on a multitude of healthcare issues, including transfer of patients, follow-up compliance, and use of the emergency department, implying its importance to and influence on the healthcare industry (Bieler et al., 2012; Delgado et al., 2014; Mannix, Stack, and Chiang, 2012; Missios and Bekelis, 2015; Stone et al., 2014). Specifically, the influence of insurance status on hospital readmissions has become a very important topic. Multiple studies have found that public insurance holders, specifically Medicare and Medicaid beneficiaries, have a higher than normal rate of being readmitted than those who are not publically insured (Gabayan et al., 2013). These types of insurance holders have also been shown to more likely self-discharge from hospitals against medical advice, indicating a potential for increasing the risk for re-injury and, thus, readmission (Menendez, et al., 2015).

Age has been found to be a significant predictor of trauma readmissions in that older individuals have a higher likelihood of returning to the hospital after traumatic injuries, supporting the claim that patients with Medicare may be at higher risk of readmission (Copertino et al., 2015; Fawcett et al., 2015). Unplanned readmission rates in trauma patients are also related to increases in patient age in Canada (Moore et al., 2014). Other studies concerning readmission after lumbar spine surgery and heart failure also support this finding (Au et al., 2012; Pugely, et
al., 2014). These factors may indicate that the Medicare patient population, an older population, is the primary population with frequent, unplanned readmission rates.

In contrast, there also have been previous studies that have found that insurance status is not a factor in readmission of trauma patients (Morris et al., 2014). Supporting this claim, a study involving readmission rates of trauma patients in a nonacademic Level II Trauma Center found that individuals 64 years and older were significantly less likely to be readmitted (Vachon, Aaland, and Zhu, 2012). These discrepancies indicate why this area should be further explored.

Aside from insurance, studies have shown that infection (Chern et al., 2015), prolonged hospital stay (Dickinson et al., 2015), and comorbidities, such as diabetes and pulmonary disease, are indicators of higher rates of readmission (Pollock et al., 2015).

Materials and Methods

Setting and Data Source

This retrospective cohort study was conducted at Baylor University Medical Center (BUMC), an urban, Level 1 trauma center in Dallas, Texas. After a patient index of all patients admitted to BUMC from January 1, 2003 through June 30, 2014 was obtained, the Dallas-Fort Worth Hospital Council (DFWHC) was consulted. A patient registry for all hospitals identifying the index BUMC patients was obtained from DFWHC. This data sample ranged from January 1, 2003 to June 30, 2015. This registry included codification of each patient’s dates of admission and discharge, hospitals admitted to, length of stays, diagnoses, treatments, procedures, after-
discharge facilities, insurance information, age in years, sex, race, mechanisms of injury, and supplementary classification of external causes of injury and poisoning (E-Codes).

The DFWHC also assigned a Regional Enterprise Master Patient Index (REMPI) number to each patient. A REMPI number is a unique identifier that is probabilistically assigned to each patient encounter, which makes it possible to identify the same patient across all encounters. Once the data were received, a sequence number was given to each encounter of each patient. This number began with “1” for the index admission and continued in numeric succession for each consecutive encounter, regardless of the type of encounter (inpatient, outpatient, etc.).

The data were then sorted by REMPI number followed by admission date in ascending order, to allow the ability to perform algebraic operations between encounters to determine admission status and lag days between encounters. An admit status of one of the following terms was given to each encounter of each patient: initial encounter, readmit, readmit last admit, and unique encounter. An “initial encounter” status indicates a patient’s index admission to BUMC. A “readmit” status indicates a patient’s readmission encounter to any North Texas hospital. Next, a “readmit last admit” label implies the final encounter of a patient recorded at any North Texas hospital within the given time frame. Finally, a “unique encounter” status is found to be the only encounter of a given patient, indicating that this patient did not return to any North Texas hospital within the time frame.
Lag days between encounters are the number of days occurring between a patient’s encounters, specifically between date of discharge and date of readmit. These numeric values were also used to determine planned return admissions and hospital transfers.

The data were then cleaned and all patient encounters indicative of the following criteria were removed: age less than 18 years, outpatient, rehabilitations, long term acute care (LTAC), skilled nursing facility (SNF), planned return admissions, and hospital transfers.

The Elixhauser Comorbidity and E codes were used to determine causes of readmission and causes of initial trauma encounters. The Elixhauser Comorbidity is an index measuring 30 groupings of comorbidities based on the ICD-9-CM coding manual. This index helps to create broader categories to help to better understand readmission rates. E codes refer to codes that categorize and provide a specific external cause of injury for each encounter.

Statistics

Demographic, clinical, and administrative data were analyzed using descriptive statistics of means and standard deviations, or counts and percentages, as appropriate. The prevalence of readmission was identified and a binary logistic regression of the dichotomous dependent variable readmission (1 = readmitted, 0 = not readmitted) was performed by testing multivariate independent variables as factors to determine which factors are significantly predictive of readmission, at the overall model 5% alpha error threshold (p < 0.05, 95% confidence interval). Only significant variables were retained as variables in the final trimmed model of readmission, where 1 = readmitted and 0 = not readmitted. Retention of the single block step multivariate
binary logistic regression model of readmission, at significance level of 95% confidence ($\rho < 0.05$) was used to identify the clinically and statistically significant risk factors of readmission, and resulted in a trimmed model where all variables in the model are independently predictive contributors to the overall Area Under the Curve – Receiver Operated Characteristics, cumulative probability of the model. SPSS v20 (IBM Corp) was used in this analysis.

Results

Overall Population

A total of 24,495 patients were found to have an index trauma admission at BUMC within the given time frame, with a total of 68,667 encounters. After excluding planned, SNF, rehabilitation, and under age encounters, a total of 28,979 encounters and 21,231 patients were analyzed (Table 1 and Table 2). Of the 21,231 patients, 16,744 patients were discharged from BUMC, did not readmit, and were given the term “unique” encounter to distinguish their single, non-readmitting encounter. The remaining 4,487 patients readmitted at least once and produced a total of 12,235 encounters. The overall rate of any readmission is 42.2% (12,235 of 28,979) (Figure 1). This breakdown, in patients, is also indicative of 21,231 index, or initial, encounters within this population. The average age of all 28,979 encounters, the 12,235 readmit encounters, and the 16,744 non-readmit, or unique, encounters were found to be 49.8 years, 57.2 years, and 44.4 years, respectively (Figure 2).
### Table 1. Count of All Encounters

<table>
<thead>
<tr>
<th>Type of Encounter</th>
<th>Age 64 Years or Younger</th>
<th>Age 65 Years or Older</th>
<th>All Encounters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Readmitted</td>
<td>7,584</td>
<td>4,651</td>
<td>12,235</td>
</tr>
<tr>
<td>Unique (Non-Readmitted)</td>
<td>13,972</td>
<td>2,772</td>
<td>16,744</td>
</tr>
<tr>
<td>Total</td>
<td>21,556</td>
<td>7,423</td>
<td>28,979</td>
</tr>
</tbody>
</table>

### Table 2. Count of All Patients

<table>
<thead>
<tr>
<th>Type of Encounter</th>
<th>Age 64 years of Younger</th>
<th>Age 65 Years or Older</th>
<th>All Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Readmitted</td>
<td>2,824</td>
<td>1,663</td>
<td>4,487</td>
</tr>
<tr>
<td>Unique (Non-Readmitted)</td>
<td>13,972</td>
<td>2,772</td>
<td>16,744</td>
</tr>
<tr>
<td>Total</td>
<td>16,796</td>
<td>4,435</td>
<td>21,231</td>
</tr>
</tbody>
</table>
Figure 1. Percent Readmission

![Bar chart showing readmission rates for different age groups.]

- **Overall**: 42.2%
- **64 Years or Younger**: 35.2%
- **65 Years or Older**: 62.6%

Population
An overall analysis reveals severe sepsis (Odds Ratio 9.46), a sequence number of 15 (OR 3.74), an urgent admit type (OR 3.15), and Elixhauser comorbidities for tumor (OR 2.93) and Lymph (OR 2.61) to be the top predictive factors of readmission in all patients (Table 3). Uninsured (other) insurance status (OR 4.85), Medicare insurance (OR 2.04), Medicaid insurance (OR 1.98), and Private Insurance (OR 1.13) were also found to be predictive of readmission in all patients. It is important to note that the term “Uninsured (other)” only includes federal and non-federal insurance types, and does not include self-pay and unknown insurance types, which were also tested and trimmed as insignificant predictors in the model.
Comparison of Ages 64 Years or Younger and 65 Years or Older

Of the 28,979 total encounters, 21,556 encounters consisted of individuals with ages 64 years or younger (64 YOY) and 7,423 encounters consisted of individuals with ages 65 years or older (65 YOO). Within the total 21,231 patients, 16,796 consisted of patients 64 YOY and 4,435 were patients 65 YOO. A further breakdown reveals 7,584 encounters 64 YOY to have readmitted and 4,651 encounters 65 YOO to have readmitted. Therefore the rate of any readmission for encounters 64 YOY is 35.2% (7,584 of 21,556) and 62.6% (4,651 of 7,423) for encounters 65 YOO. Furthermore, these numbers indicate a total of 16,796 index encounters in individuals 64 YOY and 4,435 index encounters in individuals 65 YOO.

<table>
<thead>
<tr>
<th>Predictive Factor of Readmit Ever</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>p value</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe Sepsis</td>
<td>2.25</td>
<td>0.400</td>
<td>31.615</td>
<td>1</td>
<td>0.0000</td>
<td>9.46</td>
</tr>
<tr>
<td>Uninsured (Other)</td>
<td>1.58</td>
<td>0.126</td>
<td>156.394</td>
<td>1</td>
<td>0.0000</td>
<td>4.85</td>
</tr>
<tr>
<td>Sequence Greater Than or Equal to 15</td>
<td>1.32</td>
<td>0.047</td>
<td>792.429</td>
<td>1</td>
<td>0.0000</td>
<td>3.74</td>
</tr>
<tr>
<td>Urgent Admit Type</td>
<td>1.15</td>
<td>0.049</td>
<td>544.028</td>
<td>1</td>
<td>0.0000</td>
<td>3.15</td>
</tr>
<tr>
<td>Elixhauser Tumor</td>
<td>1.07</td>
<td>0.134</td>
<td>64.368</td>
<td>1</td>
<td>0.0000</td>
<td>2.93</td>
</tr>
<tr>
<td>Elixhauser Lymph</td>
<td>0.96</td>
<td>0.327</td>
<td>8.650</td>
<td>1</td>
<td>0.0033</td>
<td>2.61</td>
</tr>
<tr>
<td>Elixhauser Complicated Diabetes</td>
<td>0.79</td>
<td>0.186</td>
<td>17.881</td>
<td>1</td>
<td>0.0000</td>
<td>2.20</td>
</tr>
<tr>
<td>Medicare Insurance</td>
<td>0.71</td>
<td>0.040</td>
<td>312.549</td>
<td>1</td>
<td>0.0000</td>
<td>2.04</td>
</tr>
<tr>
<td>Medicaid Insurance</td>
<td>0.69</td>
<td>0.059</td>
<td>133.467</td>
<td>1</td>
<td>0.0000</td>
<td>1.98</td>
</tr>
<tr>
<td>Elixhauser Liver</td>
<td>0.66</td>
<td>0.088</td>
<td>56.191</td>
<td>1</td>
<td>0.0000</td>
<td>1.93</td>
</tr>
<tr>
<td>Elixhauser Congestive Heart Failure</td>
<td>0.62</td>
<td>0.062</td>
<td>99.522</td>
<td>1</td>
<td>0.0000</td>
<td>1.85</td>
</tr>
<tr>
<td>Elixhauser Renal Failure</td>
<td>0.61</td>
<td>0.075</td>
<td>66.909</td>
<td>1</td>
<td>0.0000</td>
<td>1.85</td>
</tr>
<tr>
<td>Private Insurance</td>
<td>0.12</td>
<td>0.033</td>
<td>13.984</td>
<td>1</td>
<td>0.0002</td>
<td>1.13</td>
</tr>
</tbody>
</table>
The average age of individuals 64 YOY was found to be 38.9 years old, as compared to 78.7 years old for individuals 65 YOO.

**Insurance**

Of the total 28,979 encounters analyzed, 9,936 encounters (34.3%, 9,936 of 28,979) were insured through private insurance, 1,795 encounters (6.2%, 1,795 of 28,979) were insured through Medicaid, 7,530 encounters (26.0%, 7,530 of 28,979) were insured through Medicare, and 9,718 encounters, (33.5%, 9,718 of 28,979) were considered to be uninsured (Table 4 and Figure 3). It is necessary to note that “uninsured” encounters consist of: other federal and non-federal programs, self-payment methods, as well as unidentified payment encounters, termed “unknown.” Of the 21,556 total encounters of patients aged 64 YOY, 8,729 were insured through private insurance, 1,760 encounters were insured through Medicaid, 1,553 encounters were insured through Medicare, and 9,514 encounters were uninsured. Of the 7,423 encounters of patients aged 65 YOO, 1,207 encounters were privately insured, 35 encounters had Medicaid, 5,977 had Medicare, and 204 encounters were uninsured.
Table 4. Count of Insurance Type Used By All Encounters

<table>
<thead>
<tr>
<th>Type of Insurance</th>
<th>Age 64 Years or Younger</th>
<th>Age 65 Years or Older</th>
<th>All Encounters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>8,729</td>
<td>1,207</td>
<td>9,936</td>
</tr>
<tr>
<td>Medicaid</td>
<td>1,760</td>
<td>35</td>
<td>1,795</td>
</tr>
<tr>
<td>Medicare</td>
<td>1,553</td>
<td>5,977</td>
<td>7,530</td>
</tr>
<tr>
<td>Uninsured</td>
<td>9,514</td>
<td>204</td>
<td>9,718</td>
</tr>
<tr>
<td>Total</td>
<td>21,556</td>
<td>7,423</td>
<td>28,979</td>
</tr>
</tbody>
</table>

Figure 3. Count and Percent of Insurance Type Used By All Encounters

- Private: 9,936, 34%
- Medicaid: 1,795, 6%
- Medicare: 7,530, 26%
- Uninsured: 9,718, 34%
When the 12,235 readmitted encounters were analyzed, 3,426 encounters (28%, 3426 of 12,235) claimed private insurance, 1,057 encounters (9%, 1,057 of 12,235) claimed Medicaid, 5,031 encounters (41%, 5,031 of 12,235) claimed Medicare, and 2,721 encounters (22%, 2,721 of 12,235) claimed to be uninsured (Table 5 and Figure 4). Of the 7,584 readmitted encounters in the ages 64 YOY population, 2,776 encounters were privately insured, 1,041 encounters had Medicaid, 1,131 encounters had Medicare, and 2,636 encounters were uninsured. The 4,651 encounters of the ages 65 YOO population showed that 650 encounters had private insurance, 16 encounters had Medicaid, 3,900 encounters had Medicare, and 85 encounters were uninsured.

<table>
<thead>
<tr>
<th>Type of Insurance</th>
<th>Age 64 Years or Younger</th>
<th>Age 65 Years or Older</th>
<th>All Encounters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>2,776</td>
<td>650</td>
<td>3,426</td>
</tr>
<tr>
<td>Medicaid</td>
<td>1,041</td>
<td>16</td>
<td>1,057</td>
</tr>
<tr>
<td>Medicare</td>
<td>1,131</td>
<td>3,900</td>
<td>5,031</td>
</tr>
<tr>
<td>Uninsured</td>
<td>2,636</td>
<td>85</td>
<td>2,721</td>
</tr>
<tr>
<td>Total</td>
<td>7,584</td>
<td>4,651</td>
<td>12,235</td>
</tr>
</tbody>
</table>
Of the 16,744 non-readmitted, or unique, encounters, 6,510 encounters (39%, 6,510 of 16,744) were privately insured, 738 (4%, 738 of 16,744) encounters claimed Medicaid, 2,499 (15%, 2,499 of 16,744) encounters claimed Medicare, and 6,997 (42%, 6,997 of 16,744) encounters were uninsured (Table 6 and Figure 5). 13,972 non-readmitted encounters within the population aged 64 YOY showed a breakdown of 5,953 privately insured encounters, 719 Medicaid encounters, 422 Medicare encounters, and 6,878 uninsured encounters. Finally, of the 2,772 non-readmitted encounters of the population aged 65 YOO, 557 encounters claimed private insurance, 19 encounters claimed Medicaid, 2,077 encounters claimed Medicare, and 119 encounters were uninsured.
**Table 6. Count of Insurance Type Used By Non-Readmitted Encounters**

<table>
<thead>
<tr>
<th>Insurance Type</th>
<th>Age 64 Years or Younger</th>
<th>Age 65 Years or Older</th>
<th>All Encounters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>5,953</td>
<td>557</td>
<td>6,510</td>
</tr>
<tr>
<td>Medicaid</td>
<td>719</td>
<td>19</td>
<td>738</td>
</tr>
<tr>
<td>Medicare</td>
<td>422</td>
<td>2,077</td>
<td>2,499</td>
</tr>
<tr>
<td>Uninsured</td>
<td>6,878</td>
<td>119</td>
<td>6,997</td>
</tr>
<tr>
<td>Total</td>
<td>13,972</td>
<td>2,772</td>
<td>16,744</td>
</tr>
</tbody>
</table>

**Figure 5. Count and Percent of Insurance Type Used By Non-Readmitted Encounters**

- **Private**: 6,510 (39%)
- **Medicaid**: 738 (4%)
- **Medicare**: 2,499 (15%)
- **Uninsured**: 6,997 (42%)
**E-Code**

Using the primary E-code provided by the DFWHC for each encounter and the ICD-9-CM manual, groups relating to the external cause of injury for index encounters were created. A total of six major classifications were used to explain these external causes (Table 7). Of the total 21,231 index encounters, 4,812 encounters were not labeled with an E-code. The remaining 16,419 encounters had the following causes of admission breakdown: 6,181 encounters (38%, 6,181 of 16,419) related to motor and other road vehicle accidents, 5,013 encounters (30%, 5,013 of 16,419) related to accidental falls, 1,585 encounters (10%, 1,585 of 16,419) related to other accidents, 314 encounters (2%, 314 of 16,419) related to drugs, medicinal, and biological substances causing adverse effect in therapeutic use, 2,558 encounters (15%, 2,558 of 16,419) related to homicide and injury purposefully inflicted by other persons, and 768 encounters (5%, 768 of 16,419) related to other causes of admission (Figure 6).

### Table 7. Causes of Admission for Index Encounters

<table>
<thead>
<tr>
<th>Cause of Admission</th>
<th>64 Years or Younger</th>
<th>65 Years or Older</th>
<th>All Index Encounters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor and Other Road Vehicle Accidents</td>
<td>5,526</td>
<td>655</td>
<td>6,181</td>
</tr>
<tr>
<td>Accidental Falls</td>
<td>2,702</td>
<td>2,311</td>
<td>5,013</td>
</tr>
<tr>
<td>Other Accidents</td>
<td>1,472</td>
<td>113</td>
<td>1,585</td>
</tr>
<tr>
<td>Drugs, Medicinal and Biological Substances causing adverse effects in Therapeutic Use</td>
<td>148</td>
<td>166</td>
<td>314</td>
</tr>
<tr>
<td>Homicide and Injury Purposefully Inflicted by Other Persons</td>
<td>2,507</td>
<td>51</td>
<td>2,558</td>
</tr>
<tr>
<td>Other Causes Of Admission</td>
<td>694</td>
<td>74</td>
<td>768</td>
</tr>
<tr>
<td>Total Calculated</td>
<td>13,049</td>
<td>3,370</td>
<td>16,419</td>
</tr>
<tr>
<td>Number of Encounters with No E-Code</td>
<td>3,747</td>
<td>1,065</td>
<td>4,812</td>
</tr>
</tbody>
</table>
These E-codes were then broken down by age. For the 13,049 index encounters for patients aged 64 YOY, 5,526 encounters (43%, 5,526 of 13,049) were related to motor and other road vehicle accidents, 2,702 encounters (21%, 2,702 of 13,049) were related to accidental falls, 1,472 encounters (11%, 1,472 of 13,049) were related to other accidents, 148 encounters (1%, 148 of 13,049) were related to drugs, medicinal, and biological substances causing adverse effect in therapeutic use, 2,507 encounters (19%, 2,507 of 13,049) were related to homicide and injury purposefully inflicted by other persons, and 694 encounters (5%, 694 of 13,049) were related to other causes of admission (Figure 7).
For the 3,370 index encounters for patients aged 65 YOO, 655 encounters (19%, 655 of 3,370) were related to motor and other road vehicle accidents, 2,311 encounters (69%, 2,311 of 3,370) were related to accidental falls, 113 encounters (3%, 113 of 3,370) were related to other accidents, 166 encounters (5%, 166 of 3,370) were related to drugs, medicinal, and biological substances causing adverse effect in therapeutic use, 51 encounters (2%, 51 of 3,370) were related to homicide and injury purposefully inflicted by other persons, and 74 encounters (2%, 74 of 3,370) were related to other causes of admission (Figure 8).
Next, the causes of admission for all readmit encounters were examined. In this case, a total of eight major classifications were used to explain these encounters: the previous six, with two additional groups (Table 8). Of the 7,748 readmitted encounters, 5,532 encounters were not labeled with an E-code. The remaining 2,216 encounters had the following breakdown: 182 encounters (8%, 182 of 2,216) related to motor and other road vehicle accidents, 638 encounters (29%, 638 of 2,216) related to accidental falls, 77 encounters (3%, 77 of 2,216) related to other accidents, 445 encounters (20%, 445 of 2,216) related to drugs, medicinal, and biological substances causing adverse effect in therapeutic use, 177 encounters (8%, 177 of 2,216) related
to homicide and injury purposefully inflicted by other persons, 228 encounters (10%, 228 of 2,216) related to late effects of an accidental injury, 259 encounters (12%, 259 of 2,216) related to surgical operations and other surgical procedures as the cause of abnormal reaction of the patient, and 210 encounters (10%, 210 of 2,216) related to other causes of admission (Figure 9).

Table 8. Cause of Admission for Readmitted Encounters

<table>
<thead>
<tr>
<th>Cause of Admission</th>
<th>64 Years or Younger</th>
<th>65 Years or Older</th>
<th>All Readmitted Encounters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor and Other Road Vehicle Accidents</td>
<td>164</td>
<td>18</td>
<td>182</td>
</tr>
<tr>
<td>Accidental Falls</td>
<td>246</td>
<td>392</td>
<td>638</td>
</tr>
<tr>
<td>Other Accidents</td>
<td>52</td>
<td>25</td>
<td>77</td>
</tr>
<tr>
<td>Drugs, Medicinal and Biological Substances causing adverse effects in Therapeutic Use</td>
<td>229</td>
<td>216</td>
<td>445</td>
</tr>
<tr>
<td>Homicide and Injury Purposefully Inflicted by Other Persons</td>
<td>170</td>
<td>7</td>
<td>177</td>
</tr>
<tr>
<td>Late Effect of Accidental Injury</td>
<td>188</td>
<td>40</td>
<td>228</td>
</tr>
<tr>
<td>Surgical Operation and Other Surgical Procedures As The Cause of Abnormal Reaction of Patient</td>
<td>189</td>
<td>70</td>
<td>259</td>
</tr>
<tr>
<td>Other Causes Of Admission</td>
<td>171</td>
<td>39</td>
<td>210</td>
</tr>
<tr>
<td>Total Calculated</td>
<td>1,409</td>
<td>807</td>
<td>2,216</td>
</tr>
<tr>
<td>Number of Encounters with No E-Code</td>
<td>3,351</td>
<td>2,181</td>
<td>5,532</td>
</tr>
</tbody>
</table>
Figure 9. Count and Percent of Causes for All Readmitted Encounters

- Motor and Other Road Vehicle Accidents
- Accidental Falls
- Other Accidents
- Drugs, Medicinal and Biological Substances causing adverse effects in Therapeutic Use
- Homocide and Injury Purposefully Inflicted by Other Persons
- Late Effects of an Accidental Injury
- Surgical Operations and Other Surgical Procedures As The Cause of Abnormal Reaction of Patient
- Other Causes Of Admission
As done previously, these encounters were broken down by age. For the 1,409 readmit encounters for patients aged 64 YOY, 164 encounters (12%, 164 of 1,409) were related to motor and other road vehicle accidents, 246 encounters (18%, 246 of 1,409) were related to accidental falls, 52 encounters (4%, 52 of 1,409) were related to other accidents, 229 encounters (16%, 229 of 1,409) were related to drugs, medicinal, and biological substances causing adverse effect in therapeutic use, 170 encounters (12%, 170 of 1,409) were related to homicide and injury purposefully inflicted by other persons, 188 encounters (13%, 188 of 1,409) related to late effects of an accidental injury, 189 encounters (13%, 189 of 1,409) related to surgical operations and other surgical procedures as the cause of abnormal reaction of the patient, and 171 encounters (12%, 171 of 1,409) were related to other causes of admission (Figure 10).

For the 807 readmit encounters for patients aged 65 YOO, 18 encounters (2%, 18 of 807) were related to motor and other road vehicle accidents, 246 encounters (48%, 392 of 807) were related to accidental falls, 25 encounters (3%, 25 of 807) were related to other accidents, 216 encounters (27%, 216 of 807) were related to drugs, medicinal, and biological substances causing adverse effect in therapeutic use, 7 encounters (1%, 7 of 807) were related to homicide and injury purposefully inflicted by other persons, 40 encounters (5%, 40 of 807) related to late effects of an accidental injury, 70 encounters (9%, 70 of 807) related to surgical operations and other surgical procedures as the cause of abnormal reaction of the patient, and 39 encounters (5%, 39 of 807) were related to other causes of admission (Figure 11).
Figure 10. Count and Percent of Causes for All Readmitted Encounters for 64 Years of Age and Younger

- Motor and Other Road Vehicle Accidents
- Accidental Falls
- Other Accidents
- Drugs, Medicinal and Biological Substances causing adverse effects in Therapeutic Use
- Homocide and Injury Purposefully Inflicted by Other Persons
- Late Effects of Accidental Injury
- Surgical Operations and Other Surgical Procedures As The Cause of Abnormal Reaction of Patient
- Other Causes Of Admission
Figure 11. Count and Percent of Causes for All Readmitted Encounters for 65 Years of Age and Older

- Motor and Other Road Vehicle Accidents
- Accidental Falls
- Other Accidents
- Drugs, Medicinal and Biological Substances causing adverse effects in Therapeutic Use
- Homocide and Injury Purposefully Inflicted by Other Persons
- Late Effects of Accidental Injury
- Surgical Operations and Other Surgical Procedures As The Cause of Abnormal Reaction of Patient
- Other Causes Of Admission
Discussion

In 2011, 30-day Medicare readmissions accumulated a total of $24 billion in hospital costs (Anika et al., 2014). Exploring why this population exhibits this trend and what can be done to avoid these readmissions is crucial. This study was conducted to determine if insurance status, and in turn age, play a role in predicting readmission in trauma patients. Secondary to this, potential causes for readmission and index admissions were also found.

Using a Pearson Chi-Square Test, the readmission rates for 64 YOY (35.2%) and 65 YOO (62.6%) were found to be significantly different ($p < 0.00$, Pearson Chi-Square Value = 1708.465, with df = 1). This measurement indicates that older individuals are more likely to come back for treatment after a trauma-related injury.

When reviewing predictive factors of readmission, patients with severe sepsis were found to have the highest chances of being readmitted, with an almost 9.5 times more likely chance than patients without severe sepsis. This claim is supported by a previous study that found infectious reasons to be the major cause of readmission in surgical patients (Morris et al., 2011). Individuals who contract severe sepsis exhibit symptoms that surpass the standard definition of sepsis but do not exhibit symptoms related to septic shock. A patient who was seen 15 times or more for any reason, whether outpatient or inpatient, (sequence number) was found to be almost four times more likely to be readmitted. Also, a patient with an urgent admit type, or a walk-in patient to the emergency room who needed immediate attention, was just above three times more likely to be readmitted. Patients related to Elixhauser for tumor and lymph, usually related to
cancer-type complications, were almost three times more likely to be readmitted. Exploring these predictive factors in this manner can help focus attention to trauma patients who initially present with one, or a combination of, these factors.

The average age of 57.2 years found in this study for readmitting encounters was older than the 44.4 years of age found for encounters that did not readmit. This, again, implies the concept that older patients have a propensity for being readmitted.

Insurance status was the major focus of this study. Ladha et al., found higher rates of readmission among trauma patients who were uninsured and publicly insured (Ladha et al., 2013). One limitation to this study, however, is the exclusion of patients above the age of 64 years. This current study supports and expands upon the findings of Ladha et al., and includes patients over the age of 64. Uninsured (other) encounters, which once again are defined only by federal and non-federal insurance types, were found to have the highest chance of being readmitted, with an almost five times likelihood of doing so. Patient encounters claiming Medicare and Medicaid were two times more likely to readmit, and encounters that were privately insured were the least likely to be readmitted. When comparing percentages of insurance status between all encounters in the study, those encounters claiming private insurance, Medicare, and no insurance were very similar. When comparing insurance status amongst readmitted encounters, however, Medicare insurance was found to be the most prevalent, accounting for 41% of encounters. The percentage of Medicare insurance users amongst non-readmitted encounters was found to be much less, accounting for only 15% of these encounters. Instead,
encounters with no insurance and private insurance were found to be the majority. The relative proportion of Medicare insurance among all readmitted encounters was significantly higher than among all non-readmitted encounters ($\rho < 0.000$, Pearson Chi-Square value = 2522.209, with df = 1). These findings indicate that older patients have the tendency to readmit, rather than to be seen by a hospital only once, and never readmit. Medicaid was found to be the least likely type of insurance used by the encounters under any circumstance.

The cause for admission was examined in each index encounter at BUMC for every index encounter, for index encounters aged 64 YOY, and for index encounters aged 65 YOO. Overall, accidental falls and motor and other road vehicle accidents were found to be the two greatest causes for index admission. The previous study, in which this study is based off of, supports this finding on a smaller scale (Petrey et al., 2015). Separating the encounters by age, motor and road vehicle accidents were found to be the number one reason for encounters aged 64 YOY. In contrast, falls were overwhelmingly found to be the number one cause of individuals 65 YOO to present initially to the trauma department. In fact, the relative proportion of accidental falls to all other causes in index encounters was significantly higher among encounters aged 65 YOO compared to encounters aged 64 YOY ($\rho < 0.000$, Pearson Chi-Square value = 2900.290, with df = 1). As has been speculated in this study, patients 65 YOO tend to have higher readmission rates. This finding can be used to try and identify preventative measures of elderly falls, which can help these individuals avoid initially presenting to the trauma department. Therefore, controlling elderly falls is a clearly identified solution with great potential for making a strong contribution to decreasing trauma readmission rates.
When the cause of admission for readmission encounters was examined, accidental falls was again found to be within the top two causes. However, drugs, medicinal, and biological substances causing adverse effects in therapeutic use was within the top two causes for these encounters, while it was found to be the least likely cause of admission for index encounters. In these readmission encounters, late effects of accidental injuries, and surgical operations and other surgical procedures as the cause of abnormal reaction of a patient were also found to be contributing factors to readmission. These two groups were almost absent in index admission encounters. For encounters aged 64 YOY, other accidental causes were found to have the least propensity for readmission, and all other causes were almost equal in prevalence. This differed from the major causes of admission for index encounters aged 64 YOY. Similar to causes of admission for index encounters aged 65 YOO, falls were the number one cause of readmission in these individuals. The proportion of falls to all other causes for readmission was significantly higher among the 65 YOO population compared to 64 YOY ($\rho < 0.000$, Pearson Chi-Square value = 242.319, with df = 1) (Figure 12). Therefore, it can be concluded that falls are not only the primary cause of index admission for individuals aged 65 YOO, but they are also the primary reason for this age group being readmitted. Drugs, medicinal, and biological substances causing adverse effect in therapeutic use was the second reason for readmission.

**Limitations**

Because this study only incorporates the area of North Texas, it could be difficult to relate these claims to a national level. In addition, data was collected from all hospitals across the region, including trauma and non-trauma centers. This causes difficulty in determining which
readmissions were planned and unplanned, and which are specifically related to trauma. In relation to this, the diagnosis codes, provided by DFWHC, also cause issues in determining which code could be related to the initial trauma injury. Finally, as outpatient visits, including emergency room, radiology, ambulatory, gastrointestinal lab, cardiac catheterization, and outpatient procedure visits, were collected by the DFWHC in 2006, data before 2006 could potentially be difficult in determining which patients are outpatient visits.

**Conclusion**

This study found older individuals, specifically over the age of 65 years, to contribute more to overall readmission rates. This has been characterized by their vulnerability and tendency to fall. These accidents, in addition, account for the main reason why this population also initially present to the trauma department. Hospitals should focus on providing proper education to the elderly to help these individuals maintain a safer lifestyle. In addition, in relation to post-fall patients, hospitals as well as CMS should provide routine home visits to these patients so that they may avoid future falls. Moreover, physicians should be more cautious and attentive as to which medications they prescribe to specific patients. This might include conducting in-depth research of patient history and allergies, as this factor was also a major cause of readmissions in this patient population. Patients should also be educated in the medications they are prescribed so that they can avoid potential overdoses and are consistent in taking their prescriptions. Potential future projects could focus this study type to a larger sample population, by comparing different regions of the United States.
CHAPTER III
INTERNSHIP EXPERIENCE

My experience at Baylor University Medical Center at Dallas gave me great exposure to the field of clinical research and to the field of medicine. I assisted Dr. Laura Petrey in studying the factors that drive trauma readmissions. I also had the privilege to meet and interact with Richard Gilder, MS, RN-BC. With him, I was able to learn more about the statistics of this study, and analyzed the data first hand. In addition to this study, I was able to attend staff meetings, in which they discussed other research projects, IRB meetings, and learned the rules and regulations of clinical research. Aside from clinical research, I was able to attend clinical rounds with physicians in the ICU, shadow various physicians, observe procedures, and attend conferences related to the field of trauma.
APPENDIX A: DAILY JOURNAL

Daily Internship Journal
Baylor University Medical Center
Trauma Department

Monday, June 1, 2015

• 8 – 11am: Logistics
  o Received laptop, badge, parking permits, and other logistical items
• 11am – 12 pm: Meeting
  o Weekly meeting to discuss current studies and protocols
  o Determined if there were any updates and if any changes should be made
• 12pm – 3pm: Baylor Learning Network and Lunch
  o Read and went over necessary modules that are required by Baylor
  o Lots of information on IRB, informed consent, and other clinical research information
• 3pm – 4pm: Reading and self-research
  o Read Dr. Laura Petrey’s paper on trauma patient readmissions to understand potential research ideas

Tuesday, June 2, 2015

• 8am – 12pm: Reading and self-research
  o Continued to do more research on readmissions and learned more in depth the process and issue
• 12pm – 1pm: Trauma Conference
  o Listened to a talk about ultrasound relating to cardiovascular aspects
  o Speaker discussed different views and position of an ultrasound relating to the heart
  o Also discussed different conditions that could be detected using this method including pulmonary edema, aneurysms, etc.
• 1pm – 5pm: More research on readmissions and Lunch
  o Did research on articles and found sources that can be used to help with writing the background for the 11.5 year readmission study

Wednesday, June 3, 2015

• 8am – 12pm: More research on readmissions
  o Continued to do research on articles for the study to prepare to write the background and meet with Dr. Petrey
• 12pm – 2:30pm: Meeting with Dr. Petrey
  o Discussed plans and my role in the study
    ▪ Work to find good, credible sources that will help in the 11.5 year study and that will allow me to write the background information
  o Shown the trauma department and all areas in which I will potentially be working and utilizing
• 2:30pm – 4pm: Continue research

Thursday, June 4, 2015

• 8am – 10am: Research and writing
• 10am – 12:00pm: Clinical Rounds
  o Accompanied Dr. Jennings and other health care professionals on clinical rounds on the trauma floor
  o Saw around 15 patients
  o Listened and learned information about patients and suggestions by the physicians and other health care professionals
  o Amazing to see the amount of professionals needed to take care of one patient
    ▪ Regular physician/surgeon, nurses, pharmacists, nutritionists, rehab workers, health care workers, etc.
• 12pm – 1:30pm: Research and Lunch
• 1:30pm – 3pm: Meeting with Megan and Rehab visit
  o Took a tour of the rehabilitation center and learned basics of the mechanism of patients moving from trauma to rehab
  o Met with Megan to talk more about the 11.5 year readmission study and narrow down ideas for thesis ideas
    ▪ Insurance in relation to readmission
    ▪ Mental status in relation to readmission
  o Main goal as of right now = more literature search to find more papers and findings
• 3pm – 4pm: Research

Friday, June 5, 2015

• 8am – 9am: Research
• 9am – 10am: Meeting with John in the Library
  o Learned the ins and outs of how to properly do research and find articles through PubMed
  o Great session, and learned how to find specific articles for my topic more precisely, and more easily
• 10am – 12pm: Research
Monday, June 8, 2015

- 8am – 11pm: Research
  - Gathered all articles found and went through them one by one determining which can be used to help with readmission in relation to insurance and in general

- 11pm – 12pm: Weekly meeting
  - Updates on current studies done by the surgical department

- 12pm – 4pm: Research
  - Also talked to Brad, who worked on the one year study, during this time
    - Showed me the data set for the 11.5 year study, helped me understand it, and gave me ideas for how to tackle my work

Tuesday, June 9, 2015

- 8am – 10am: Research
- 10am – 11:30am: Clinical Rounds
  - Made rounds in the Trauma ICU with Dr. Petrey listening to updates of patients and diagnosis from multiple health care personnel

- 12pm – 1pm: Trauma Conference
  - Neuromuscular blocks in ARDS

- 1pm – 5pm: Research

Wednesday, June 10, 2015

- 8am – 4pm: Research
  - Continued finding more articles that can help with trauma readmissions and insurance
  - Idea: Limit data to individuals aged 18-65 to take out potential for Medicare patients to overload data
Thursday, June 11, 2015

• 8am – 10am: Research
• 10am – 12pm: Clinical Rounds
  o Rounds with Dr. Petrey
  o Some new patients with new conditions, some same patients who have been improving
  o Lots of communication and understanding between health care personnel
• 12pm – 2pm: Research and Lunch
• 2pm – 3pm: Trauma Grand Rounds
  o Best practices in organ and tissue donations
  o Presentation on how families should go about organ/tissue donations and the problems that can be faced and are faced today
• 3pm – 5pm: Research

Friday, June 12, 2015

• 8am -1pm: Research
• 1pm – 2pm: Monthly Trauma/Critical Care/Acute Care Surgery Research Meeting
  o Monthly meeting discussing current research projects in this department

Monday, June 15, 2015

• 8am – 11:30am: Research
• 11:30am – 12:30pm: Team lunch
  o It was Martha’s birthday last week so Tammy was very generous and bought us all lunch
• 12:30pm – 3:00pm: Research
• 3:00pm – 5:00pm: Meeting with Dr. Petrey

Tuesday, June 16, 2015

• 8am – 12pm: Shadowed Dr. Alan Jones
  o Dr. Jones is a trauma orthopedic surgeon and is in clinic every Tuesday
  o We mainly saw patients he operated on as a follow up appointment
  o All patients came in through the ER
  o Saw:
    ▪ Should and knee injuries
    ▪ Tibia, fibula, humerus and femur breaks
    ▪ Breaks because of bullet injuries, falls, and motorcycle accidents
• 12pm – 1pm: Trauma Conference
  o Intracranial Pressure Management
• 1pm – 5:00pm: Shadowed Dr. Jones

**Wednesday, June 17, 2015**

• 8am – 2pm: Research

**Thursday, June 18, 2015**

• 8am – 10am: Research
  o Finishing up review of articles
• 10am – 2:30pm: Rounds and Lunch
  o Rounds this time were at “The Floor” – where patients go post-ICU
  o Two Doctors and two residents were there
• 2:30pm – 3:30pm: Talked to Tammy
  o She explained two studies with me in which I might be gaining consent for
    - Exparel
    - Chest Tube
• 3:30pm – 5pm: Reading protocols on Exparel and Chest tube studies

**Friday, June 19, 2015**

• 11am – 6pm: ATLS
  o Advanced Trauma Life Support training is required for entering residents
  o I was a practice patients who was involved in a drive-by shooting
  o I was assessed, and “saved” by the residents

**Monday, June 22, 2015**

• 8am - 10am: Research and begin writing proposal
• 10am – 11am: Weekly Research Meeting
  o Updates on research in surgical department
• 11am – 4pm: Research and Writing

**Tuesday, June 23, 2015**

• 8am – 11am: Shadow Dr. Jones, Orthopedic Trauma Surgeon
• 11am – 4pm: Research, Writing, and Lunch

**Wednesday June 24, 2015**
• 8am – 9am: Research and Writing
• 9am – 10am: Meeting with Dr. David Arnold
  o Dr. Arnold is a general surgeon
  o Med students that are here for the summer are helping him with a study involving readmission after a lap choleo and other gall bladder procedures
  o This meeting was for the students to show Dr. Arnold the data that they have organized and what to do from here
  o Lots of data cleaning and data organizing before actual data analysis can be done
• 10pm – 1pm: Research, Writing, and Lunch
• 1pm – 2pm: Audit IRB meeting
  o A monitor came in to oversee a study and make sure the informed consent process for this study was properly followed
  o Huge learning experience that shows how serious the IRB takes each study
• 2pm – 4:30pm: Writing and Research

Thursday, June 25, 2015

• 8:30am – 10:30am: Enneagram Knowledge in the workplace
  o Workshop that helps Baylor Employees learn their personality trait and learn those of others so they can appropriately interact with every individual in their workplace
• 10:30am – 11am: Meeting with Dr. Cavaness
  o Meeting with Dr. Cavaness, an osteopathic physician to possibly allow me to shadow him
• 11am – 4pm: Enneagram Knowledge in the workplace
• 4pm – 5pm: MIS meeting with DSMB
  o Minimally Invasive Surgery meeting to talk about a study and determine if any adverse events occurred
  o Also talked about future projects that could be done

Friday, June 26, 2015

• 8am – 9am: Research and Writing
• 9am – 10am: FDA Guidelines for the Protection and Ethical Treatment of Human Research – presentation
  o Presentation by Bridget Moty about what sites can expect and should do during an FDA inspection
• 10am – 11am: Research and Writing
• 11am – 12:30pm: Conference Call
This meeting was a phone call with DFW Hospital Counsel
  ▪ They are a counsel that collects patient data from all across the DFW and makes it accessible to researchers
  ▪ This is where Dr. Petrey received her data from
  ▪ They explained the basics of what they do and how you can receive data from them
• 12:30pm – 3pm: Research, Writing, and Lunch

Monday, June 29, 2015

• 8am – 5pm: Research and Writing

Tuesday, June 30, 2015

• 9am – 10am: Research and Writing
• 10am – 1pm: Shadowing Dr. Keith Cavaness
  ▪ Surgical osteopathic oncologist
  ▪ Today we visited with patients who Dr. Cavaness operated on
    ▪ Ranging from gallbladder cancer to pancreatic cancer
  ▪ Also saw a patient with an inguinal hernia
  ▪ In addition, Dr. Cavaness recruits potential study participants, allowed me to see this process first hand
• 1pm – 2pm: Lunch
• 2pm – 4pm: Shadowing Dr. Cavaness

Wednesday, July 1, 2015

• 9am – 10:30am: Research
• 10:30am – 11:30am: Meeting with Dr. Petrey
  ▪ Meeting to review what I have done this far and to further talk about my proposal project
• 11:30am – 1am: Lunch and more research
• 1am – 4am: meeting with Richard Gildard
  ▪ Statistician working on Dr. Petrey’s data for the study

Thursday, July 2, 2015

• 8am – 9am: Research
• 9am – 12pm: Rounds in ICU
• 12pm – 3pm: Lunch and Research
**Friday, July 3, 2015**

- Holiday

**Monday, July 6, 2015**

- 8am – 4pm: Writing proposal

**Tuesday, July 7, 2015**

- 8am – 10am: Writing proposal
- 10am – 5:00pm: Shadowing Dr. Cavaness
  - Today was a bit more eventful than last week in that I saw Dr. Cavaness perform two cyst type removals
    - One being on the back, and one on the neck
  - Also saw multiple patients post-surgery to check on their status
    - Pancreatic cancer patients were the majority today

**Wednesday, July 8, 2015**

- 8am – 2:30pm: Writing proposal
- 2:30pm – 4pm: Meeting with Dr. Petrey
  - Went over what I have written so far with my proposal
  - Gave me some tips and ideas for the future

**Thursday, July 9, 2015**

- 8am – 9:30am: Writing proposal
- 9:30am – 11:30am: Budget review with Tammy
  - Tammy allowed me to sit with her as she compiled the budget for a study
  - She showed me how to do the budget, what it entails, and what facts to consider
  - There is a lot that goes in to make a study happen…and a lot of money and time
- 11:30am – 4pm: Writing

**Friday, July 10, 2015**

- 8am – 3pm: Proposal Writing

**Monday, July 13, 2015**
• 8am – 11:30am: Edits on proposal
• 11:30am – 12:30pm: Meeting with Dr. Petrey to go over Proposal
  o Made edits and changes to improve my proposal
• 12:30pm – 2pm: Continue with edits
• 2pm – 3pm: Meeting with Tammy to go over proposal
  o She gave me her input and edits for my paper
• 3pm – 4pm: Edits on Proposal

Tuesday, July 14, 2015

• 8am – 10am: Edits on Proposal
• 10am - 4pm: Shadowing Dr. Cavaness
  o Today Dr. C mentioned enrolling a patient for a study

Wednesday, July 15, 2015

• 8am – 9:30am: Continue edits on proposal
• 9:30am -10:30am: Consenting with Martha
  o Today Martha and I went to see a patient to see if they would like to enroll in PACES – Preventing Adenomas of the Colon with Eflornithine and Sulindac
    ▪ I watched how Martha consented the patient, read over the consent form, and learned about the study
    ▪ Unfortunately, the patient was not willing to participate
• 10:30am – 3pm: Edits on proposal
• 3pm – 4:30pm: Meeting with Jennifer Thomas to go over proposal
  o She gave me her input and edits for my paper

Thursday, July 16, 2015

• 8am – 12pm: Making edits on proposal based on Dr. Kirchhoff’s suggestions
• 12pm – 2pm: IRB Meeting
  o Attended this meeting to learn how the board addresses edits for current studies and how they determine approval for new studies
  o Almost 15 members were there ranging from physicians to people who are not associated with the healthcare fields
  o Lots of interesting studies were discussed and it was interesting to witness the process and discussions for approval
• 2pm – 4pm: Last edits
  o Finished the last bits of edits and submitted my proposal 😊
Friday, July 17, 2015

• 7am – 8:30am: Vascular Research Meeting
  o Meeting with doctors, residents, fellows, and research personal to discuss ongoing research projects in the department
• 8:30am – 2pm: Going through the data for my thesis and 11.5 year readmission study
  o I am now starting to review the data on my own to see which patients are trauma patients, etc.
  o Analysis of the data will occur every Thursday with Richard Gilder

Monday, July 20, 2015

• 7am – 10pm: Continuing going through data
• 10pm – 10:30pm: Consenting
  o Accompanied Tammy to the ER to visit a potential patient for the nurse driven chest tube study
  o At this time, the patient was in extreme pain and was not coherent enough to understand the study, or consent
• 11pm – 12:00pm: Meeting
  o Weekly Surgical Meeting
  o Updates on the ongoing studies in this department
• 12pm – 12:30pm: Consenting
  o We went back to see the patient and, although he was coherent this time, he was not willing to consent
• 12:30pm – 2pm: Data Analysis

Tuesday, July 21, 2105

• 7am – 10pm: Data Analysis
• 10pm – 3:30pm: Shadowing Dr. Cavaness
  o Today we saw many follow up patients that we had seen earlier, as well as new patients who were recommended by other physicians

Wednesday, July 22, 2015

• 7:00am – 9am: Annual meeting by the department of general surgery to discuss how the year went
  o The department made great strides this past fiscal year and has many plans for the future
  o Many studies are being done and many initiatives are being taken to continue, and improve, patient care
• 9am -12pm: Continue review and analysis of data
• 12pm – 1:30pm: Med School Student thank you luncheon
  o The department held a lunch at Stackhouse Burgers to thank the medical schools for all they have done this year
  o Texas A&M students who were here for the summer helping to do research
• 2:30pm – 3:30pm: Consenting of a patient
  o I accompanied Tammy again to try and consent and another patient for the nurse driven test tube study
  o Unfortunately, this patient did not meet eligibility requirements and could not be enrolled

**Thursday, July 23, 2015**

• 8am – 12pm: Data review
• 1pm – 4pm: Meeting with Richard Gilder
  o Today Mr. Gilder and I went over what he has done to the data
  o He has cleaned up the data by removing all duplicates and outpatient data
  o Now the data needs to be organized in terms of trauma
  o Mr. Gilder went over the data with me so that I can understand it better
  o We also discussed my thesis to determine if calculations and measurements could be taken

**Friday, July 24, 2015**

• 7am – 12:30pm: Review of data that Richard has shared with me
  o Now I will review the data that has been cleaned to understand it better and familiarize myself with it
• 12:30 – 3pm: Monthly Trauma/Critical Care/Acute Care Surgery meeting
  o This meeting is to discuss the current project and to give any updates in general

**Monday, July 27, 2015**

• 7am – 2pm: Data Review

**Tuesday, July 28, 2015**

• 7am – 2pm: Data Review
• 2pm – 4pm: CTO Staff Meeting
  o Semi-annual meeting where they discussed new job roles, expectations, and how the past fiscal year went

**Wednesday, July 29, 2015**
• Permission to take off to work on medical school application and meet with UNTHSC writing instructors

Thursday, July 30, 2015

• 7am – 12pm: Preparation for meeting with Richard Gilder and review of data
• 12:30pm – 3pm: Meeting with Richard Gilder
  o Today, Mr. Gilder talked about the Elixhauser comorbidity model
    ▪ This a model that groups specific diagnoses codes into broader categories
    ▪ We will be using this approve when determining factors related to readmission
  o We have cleaned up the data to include inpatient data only
    ▪ We still need to clean it further to remove rehab and transfer patients
  o We did an initial run and found congestive heart failure to be a big factor in readmissions
    ▪ Further analysis will be done

Friday, July 31, 2015

• 8am – 2pm: Review of Data
• 2pm – 3pm: Meeting with Dr. Petrey
  o Gave Dr. Petrey an update on my meetings with Mr. Gilder

Monday, August 3, 2015

• 7:30am – 9am: Baylor Learning Network
  o Enrolled in an online assignment to learn more about the Baylor EMR and how to access patient information for research
• 9am – 11am: Finding patients
  o Attempting to find patients in the EMR to try and determine which patients can be considered rehab transfer patients
• 11am – 12pm: Weekly meeting – Surgical department
  o Updates on current studies
• 12pm – 3pm: Finding patients
• 3pm – 4pm: BIR Open Forum Monthly Research Meeting
• 4pm – 5:30pm: Meeting with Dr. Petrey

Tuesday, August 4, 2015
• 7am – 3pm: Cleaning data
  o Now that I have learned how to use the EMR, I will go through the data to determine which encounters can be cleaned

Wednesday, August 5, 2015

• 7am – 3pm: Cleaning data

Thursday, August 6, 2015

• 7am – 12:30pm: Cleaning data
• 1pm – 3:30pm: Meeting with Richard Gilder
  o We determined that all encounters who have visited a Rehab or Skilled Nursing Facility will be taken out of the data as they are considered “planned” readmissions
  o Went over questions I had with him regarding a few encounters
  o Showed me the process he is making in terms of data analysis

Friday, August 7, 2015

• Permission to take off to work on medical school application

Monday, August 10, 2015

• 7:30am – 3:30pm: Cleaning Data

Tuesday, August 11, 2015

• 7:30am – 3:30pm: Cleaning Data

Wednesday, August 12, 2015

• 7:30am – 3:30pm: Cleaning Data

Thursday, August 13, 2015

• 7:30am – 12pm: Cleaning Data
• 1pm – 3:30pm: Meeting With Richard Gilder
  o We went over questions that I had in regards to encounters that should be taken out
  o Showed me his continued progress with the Exlixhauser Comorbidity coding
Friday, August 14, 2015

• 7:30am – 3:30pm: Cleaning Data

Monday, August 17, 2015

• 7:30am – 3:30pm: Cleaning Data

Tuesday, August 18, 2015

• 7:30am – 3:30pm: Cleaning Data

Wednesday, August 19, 2015

• 7:30am – 3:30pm: Cleaning Data

Thursday, August 20, 2015

• 7:30am – 12pm: Cleaning Data
• 12pm – 3:30pm: Meeting with Richard Gilder
  o Continued with my questions regarding encounters that could be taken out
  o Getting closer to the final steps of cleaning this data

Friday, August 21, 2015

• 8am – 3:30pm: Cleaning Data

Monday, August 24, 2015 – Friday, September 4, 2015

• Data cleaning, Data analysis, and short vacation

Monday, September 7, 2015

• Labor Day

Tuesday, September 8, 2015

• 7:30am – 8:30am: Meeting with Dr. Petrey
• 8:30am – 11am: Data cleaning
• 11am – 12pm: Weekly Meeting
• 12pm – 3:30pm: Lunch and Data Cleaning

Wednesday, September 9, 2015

• 8am – 4pm: Last bit of data cleaning

Thursday, September 10, 2015

• 8am – 12pm: Preparation for meeting with Richard Gilder
• 1pm – 4pm: Meeting with Richard Gilder
  o We determined, with Dr. Petrey, that the next step in this process is for me to go through the Super Utilizers – individuals with 4 or more encounters – and determine if their encounters are related to the initial encounter.
  o Also went over some more data that he has calculated

Friday, September 11, 2015

• 8am – 4pm: Begin going through Super Utilizers

Monday, September 14, 2015

• 8am – 4pm: Continue going through the Super Utilizers
  o Many individuals are who come back are related to infection of hardware, or other orthopedic reasons

Tuesday, September 15, 2015

• 8am – 2pm: Going through Super Utilizers
• 2pm – 3pm: Baylor Research Institute Monthly Staff Meeting
  o Presentation to talk about grants and contracts
    ▪ How departments should request and fill these out

Wednesday, September 16, 2015

• 8am – 4pm: Super Utilizers
  o Seems like that if an encounter is related to the initial, it is within 100 days of the initial

Thursday, September 17, 2015
• 8am – 12pm: Begin outlining Thesis
• 1pm – 4pm: Meeting with Richard Gilder
  o We went through first analysis of comorbidities and looked at how the data relates to Insurance status
  o Excited about the potential results of this data

Friday, September 18, 2015

• 8am – 3pm: Super Utilizers

Monday, September 21, 2015

• 8:30am – 4:30pm: Continuing to go through the Super Utilizers and their encounters

Tuesday, September 22, 2015

• 8:30am – 4:30pm: Super Utilizers

Wednesday, September 23, 2015

• 8:30am – 4:30pm: Super Utilizers

Thursday, September 24, 2015

• 8am – 4pm: Thesis work

Friday, September 25, 2015

• 8:30am – 4:30pm: Super Utilizers

Monday, September 28, 2015 – Wednesday, October 7, 2015

• 8:30am – 4:30pm: Super Utilizers
  o Completed going through all 700+ patients that are considered utilizers to determine if their encounters are related to their initial trauma encounter
    ▪ Many of the same trends I found previously were continued through out

Thursday, October 8, 2015

• 8:30am – 12pm: Thesis work
• 1pm – 4:30pm: Meeting with Richard Gilder
Today we talked with Dr. Petrey and updated her on the current progress we were making with the data set.

We also extracted the data that I will need for my thesis project so that I can begin writing.

I will continue to receive data as I meet him again.

**Friday, October 9, 2015**

- 8:30am – 11am: Begin writing results section for thesis
- 11am – 2pm: Employee Appreciation Picnic
  - Baylor throws a picnic/party for their employees every year
  - This year the theme was football
  - There was a different array of food to eat and games to play

**Monday, October 12, 2015 – Tuesday October 27, 2015**

- Constant writing and editing of thesis

**Wednesday, October 28, 2015**

- Submission of Thesis 😊

**Wednesday, November 11, 2015**

- Dissertation day 😊
REFERENCES


Cost and Utilization Project (HCUP) Statistical Briefs [Internet]. Rockville (MD): Agency for Health Care Policy and Research (US); 2006


