Residential Rehab Length of Stay Post TBI – Key Contributing Factors

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Introduction

A common question when clients enter rehabilitation is: “How long am I likely to stay?” This regression analysis attempts to answer this question via reflection on past data with the criteria:  

a) Information known on day of admission to rehab
b) With information relating to duration of post traumatic amnesia (PTA)

Previous work explored the following variables in relation to length of stay (LoS) in Rehab:  

- On admission to Rehab
  
<table>
<thead>
<tr>
<th>Variables</th>
<th>Gender</th>
<th>FIM Motor</th>
<th>FIM Cognition</th>
<th>LOS in hospital</th>
<th>Age</th>
<th>GCS</th>
<th>Neurological complications</th>
<th>Non neurological complications</th>
<th>Cause of injury</th>
<th>Level of education</th>
</tr>
</thead>
<tbody>
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</table>

Do these match what we found at ABI?

Method

1. Brain storming:
   a) What variables may contribute to LoS?
   b) And of these do we have the information?

2. Decision re method: multiple linear regression
3. Set inclusion criteria for sample:  
   - Clients with moderate to severe TBI
   - Discharged between 01/04/14 and 31/03/15
   - From Auckland & Wellington facilities

4. Revision of sample & set exclusion criteria:  
   - LoS at ABI > 150 days
   - Incomplete/missing data & outliers
   - Clients who died or went back to hospital
   - Still in PTA on time of discharge

5. Decision on 2 regression models

Results

- Summary Output Tables:
  - F-statistics: 6.9%
  - R-squared: 1.9%
  - Observations: 138
  - Coefficients: P-value

- Scatter plots of interest in relation to LoS in Rehab:
  - Length of PTA: strong positive
  - FIM Motor*: strong negative
  - Age: weak positive

Example:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
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<tbody>
<tr>
<td>FIM motor*</td>
<td>50</td>
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<tr>
<td>DOM total*</td>
<td>5</td>
</tr>
<tr>
<td>LoS hospital</td>
<td>12 days</td>
</tr>
<tr>
<td>FAM total*</td>
<td>70</td>
</tr>
<tr>
<td>LoS duration</td>
<td>20 days</td>
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</tbody>
</table>

Applying regression model to the example for the 2 scenarios would result in the following LoS:

- LoS Duration: 27 days
- LoS Total: 24 days

Discussion

ABI Rehabilitation’s data suggests there are significant variables known at the point of admission that can assist with the question surrounding LoS. Interestingly we found age to not be one of them. Also consistent with previous studies FIM motor* and LoS in hospital played a significant role in determining LoS. When determining LoS within ABI Rehabilitation, at the point of admission, there is merit in factoring in the identified significant variables. However, given the heterogeneous nature of traumatic brain injury the authors recommend that an individualised approach is taken. PTA duration is strongly linked to LoS in rehab and once known this regression model is stronger. However, prior to knowing this, initial Westmead score is a significant variable. Further investigation into the significance of other variables including pre-injury education level, acute imaging findings, duration of impaired consciousness and secondary injuries may strengthen the model. In addition, further exploration into the significant finding of region within this study would be of interest.

References

4. Image designed by Freepik.com

Poster presented at the AFRM / NZRA Combined Rehabilitation Meeting; Wellington, New Zealand; 13 – 17 October, 2015.

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