Quantifying Case Complexity at a Level I Trauma Center

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The Challenge

Defining registry team member productivity can be a challenge. Historic measures of registrar productivity included work load units such as number of records closed in a defined period, and considered factors such as length of stay or ISS. In our urban, high volume center, these measures did not accurately reflect the resources necessary to achieve and maintain a concurrent trauma registry in accordance with the ACS Optimal Resources document, the "orange book." We needed another way to drill down on case complexity for the patient population at our Level I trauma center.

Intervention

We aimed to identify case characteristics that increase abstraction time in an effort to represent case complexity. A point value was assigned for each characteristic. The sum of the points yielded a complexity score representative of the abstraction workload for a given case. We developed a report in our trauma registry software to automatically generate a rules-based complexity score for all registry cases. A higher total score represents higher case complexity correlating with longer abstraction time.

Case Characteristics	Points
Close any record	10
Transfer In	5
>/=4 Trips to OR or >/=8 Trips to OR	5 or 10
ISS>/=25 or ISS>/=55	5 or 10
ICU LOS>/=10 days or ICU LOS>/=20 days	5 or 10
Hosp LOS >/= 30 d or for Hosp LOS >/= 60 d	5 or 10
Each complication captured	3
Each comorbid captured	3

Figure 1

Experienced vs Inexperienced

Abstractors with >1 Year Experience

2017	Abstractor A	Abstractor B	Abstractor C	Average
January	3543	1169	442	1718
February	863	461	751	692
March	1175	934	1020	1043
April	1069	406	550	675
May	1000	760	1181	980
June	1436	769	853	1019
July	1252	914	959	1042
August	1983	807	1234	1341
September	1502	1303	1077	1294
October	1809	1254	1081	1381
November	305	413	871	530
December	403	339	770	504
				1018

Abstractors with <1 Year Experience

Abstractor A	Abstractor B	Average
84	90	87
376	364	370
430	178	304
365	75	220
261	217	239
		244

Figure 2

New Abstractor Progression

2018	Abstractor A	Abstractor B	Abstractor C	Average	% Increase
January					
February	210	87	190	162	
March	482	206	441	376	**132%**
April	579	349	594	507	**35%**
May	752	406	645	601	**18%**

Observations

Points accrued by each team member over the course of the year were amassed. Experienced team members with >1 year of registry abstraction experience exhibited capacity to abstract higher case complexity over a shorter period of time as compared to abstractors with < 1 year of experience. On average, experienced team members abstracted greater than an average of 1000 points monthly, whereas newer team members abstracted less than an average of 300 points monthly.

We then ran the same report to observe case complexity for records closed during the first five months of 2018, during which time our team added three additional abstractors. We observed a considerable increase in capacity amongst these abstractors represented by an increasing number of points abstracted monthly. An average of 162 points was abstracted the first month, followed by a 132% increase in month two. During the third month, these abstractors exhibited an additional 35% increase in points abstracted over the second month. The case complexity factor represented in this model can potentially inform expected registrar training progression.

Limitations:

- Variable quality of physician documentation
- Inability to include blood products and TQIP process measures fields which generally represents additional abstraction time
- Protracted autopsy results can result in late changes which may not be reflected in initial point calculations

Conclusion

- Assigning points to case characteristics is useful for gauging productivity including increasing capability and efficiency
- Reports are generated monthly to observe for trends