Words Matter: Improving Inpatient Documentation of High-Risk Diagnoses

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Disclosure of Financial Relationships

• None
Background

• Importance of documentation
  • Conveys a patient’s condition to other providers
  • Determines reimbursement
  • Facilitates clinical research using EMR data
  • Impacts quality/safety metrics

Background

• Mortality Index

<table>
<thead>
<tr>
<th>Observed Mortality</th>
<th>Expected Mortality</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

UCLA Children's Hospital
Background

• APR-DRG
  • Each hospitalization is assigned an all patient refined diagnosis-related group (APR-DRG)
    • Predicts hospital resource utilization
  • Sub-classified based on several factors, including ICD diagnoses that increase a patient’s risk of mortality
    • Complications and comorbidities (CC)
    • Major complications and comorbidities (MCC)

Background

• Diagnoses
  • Fever, unspecified
  • High risk diagnoses (CC)
    • SIRS or Bacteremia
  • Highest risk diagnoses (MCC)
    • Sepsis

Expected Mortality
Background

• **Coders** extract diagnoses from notes
  - Aren’t medically trained
  - Can’t look at other parts of chart or make clinical inferences

• **Residents** are responsible for most of the documentation
  - Aren’t trained in the importance of documentation

• **Example**
  - 5yo male with ESRD s/p failed DDRT, now HD dependent, presents with fever...
Background

SIRS = ≥2: Temp ↑ or ↓, WBC ↑ or ↓, bandemia, tachycardia, tachypnea

Sepsis = SIRS + suspected or proven infection
Background
Background

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>POA</th>
<th>RAC</th>
<th>MDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>780.50</td>
<td>Fever, unspecified</td>
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</tbody>
</table>

Objective

- Evaluate inpatient pediatric resident notes to determine which high-risk diagnoses are commonly missed.
- Create an intervention to improve documentation of these diagnoses.
- Examine the efficacy of interventions in improving documentation of these diagnoses.
Methods

• Setting
  • Tertiary care academic children’s hospital within a hospital

• Charts Reviewed
  • Inclusion criteria
    • Discharges from ward or PICU
    • Notes written by residents
  • Exclusion criteria
    • NICU, CT-ICU
    • LOS <2 days
    • Notes written by attendings, fellows, ancillary staff

Methods

• Baseline
  • 220 charts from discharges between 7/1 – 12/31/2013
    • 67% of charts had at least 1 missing high-risk diagnosis
  • Identified 13 most frequently missed high-risk diagnoses

<table>
<thead>
<tr>
<th>Target Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Kidney Injury</td>
</tr>
<tr>
<td>Acidosis</td>
</tr>
<tr>
<td>Alkalosis</td>
</tr>
<tr>
<td>Malnutrition</td>
</tr>
<tr>
<td>Chronic Renal Failure</td>
</tr>
<tr>
<td>Epilepsy</td>
</tr>
<tr>
<td>Sepsis</td>
</tr>
<tr>
<td>Shock</td>
</tr>
<tr>
<td>Heart Failure</td>
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<tr>
<td>Hypertension</td>
</tr>
<tr>
<td>Pancytopenia</td>
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<tr>
<td>Anemia</td>
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<tr>
<td>Neutropenia</td>
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</tbody>
</table>
Methods

• Created a rubric
  • Systematically focus on these diagnoses
  • Standardize the review process
• 4 PHM attendings were trained
  • Not present
  • Present and documented
  • Present but not documented
• Inter-rater agreement of >90%

Interventions

• Started 6/2014
• Physician education
• Reference cards
• Note templates
Methods

• Selected 100 charts from 7/1-12/31/2013, 2014, 2015
  • Included all mortalities from ward or PICU
• Average within-disease probability of missed high-risk diagnoses was compared across time (pre- and post-intervention) using a mixed effects logistic regression model with disease random intercept

Methods

• Primary outcome
  • Reduction in undocumented target high-risk diagnoses
• Secondary outcomes
  • Efficacy of EMR templates
  • Changes in expected mortality*

(*as measured by Clinical Data Base and Resource Manager™ owned by Vizient, formerly known as University Health-System Consortium)
Results

Table 2: Differences in the Probability of a “Present but not Documented” Diagnosis Over Time

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Probability of Undocumented Diagnosis Pr (95% CI)</th>
<th>2014 vs 2013</th>
<th>2015 vs 2013</th>
<th>2015 vs 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Diagnoses</td>
<td>0.52 (0.47, 0.57) 0.36 (0.32, 0.40) 0.37 (0.32, 0.42)</td>
<td>0.51 (&lt;.001)</td>
<td>0.50 (&lt;.001)</td>
<td>0.99 0.94</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>0.30 (0.02, 0.58) 0.22 (0.05, 0.66) 0.19 (&lt;.00, 0.38)</td>
<td>0.69 0.66 0.54 0.51 0.78 0.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td>0.57 (0.20, 0.94) 0.83 (0.54, 1.13) 0.87 (0.65, 1.10)</td>
<td>3.75 0.32 5.25 0.21 1.40 0.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>0.44 (0.27, 0.61) 0.22 (0.13, 0.37) 0.30 (0.17, 0.44)</td>
<td>0.42 0.07 0.55 0.21 1.30 0.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart Failure</td>
<td>0.92 (0.76, 1.07) 0.62 (0.29, 0.96) 0.55 (0.25, 0.84)</td>
<td>0.15 0.14 0.11 0.07 0.72 0.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acidosis</td>
<td>0.41 (0.23, 0.59) 0.25 (0.06, 0.44) 0.14 (&lt;0.01, 0.28)</td>
<td>0.47 0.24 0.22 0.04 0.47 0.36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alkalosis</td>
<td>0.63 (0.39, 0.86) 0.60 (0.35, 0.85) 0.50 (0.10, 0.90)</td>
<td>0.90 0.89 0.60 0.60 0.67 0.68</td>
<td></td>
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</tr>
<tr>
<td>Malnutrition</td>
<td>0.77 (0.60, 0.93) 0.80 (0.62, 0.98) 0.71 (0.52, 0.91)</td>
<td>1.18 0.83 0.74 0.66 0.63 0.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Acute Kidney Injury</td>
<td>0.61 (0.39, 0.84) 0.20 (0.06, 0.34) 0.24 (0.03, 0.44)</td>
<td>0.16 0.00 0.20 0.03 1.23 0.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic Renal Failure</td>
<td>Insufficient N Insufficient N Insufficient N</td>
<td>Insufficient N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Pancytopenia</td>
<td>0.69 (0.44, 0.91) 0.75 (0.59, 0.91) 0.61 (0.30, 0.84)</td>
<td>1.36 0.66 0.71 0.64 0.52 0.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neutropenia</td>
<td>0.20 (0.05, 0.45) 0.35 (0.14, 0.56) 0.41 (0.18, 0.65)</td>
<td>2.15 0.40 2.80 0.27 1.30 0.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Anemia</td>
<td>0.40 (0.24, 0.56) 0.18 (0.06, 0.36) 0.24 (0.10, 0.38)</td>
<td>0.33 0.04 0.48 0.16 1.47 0.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Sepsis</td>
<td>0.59 (0.44, 0.73) 0.39 (0.24, 0.54) 0.42 (0.26, 0.59)</td>
<td>0.44 0.07 0.50 0.16 1.15 0.77</td>
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</tbody>
</table>

- 49% decrease in the odds of having a “present, not documented” diagnosis, p<0.001
- 2015: improvement sustained, p<0.001
Results

• Secondary outcomes
  • No significant difference between diagnoses included in EMR template vs those that were not (p=0.55)
  • Expected mortality
    • 0.76 (2013) → 0.78 (2014) → 0.93 (2015)

Conclusions

• Pediatric resident notes were less likely to omit high-risk diagnosis after our interventions
• Note template modifications did not provide added benefit to educational interventions alone
• Overall, curriculum development is an effective method of improving documentation with goal of ultimately improving the accuracy of health systems performance indices
Conclusions

• Limitations
  • Generalizability- Single center design, resident notes only
  • Simultaneous roll-out- Cannot comment on effectiveness of individual components of intervention
  • Retrospective- Uncertainty in whether a diagnosis was truly present or not
    • “DRG Creep”- Diagnosis documented but not applicable
  • Mortality index causality- Multiple variables affect mortality data so it is difficult to determine if interventions had direct causal impact on quality metrics

Conclusions

• Future Directions
  • Target additional diagnoses
  • Include attending and fellow documentation
  • Implement a documentation review specialist to audit charts in real time
  • Utilize EMR technology to assist in physician documentation based on existing data in other areas of the chart
  • Survey the effect of these interventions on residents
Thank you!