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Filling the Void: A Low Cost, High-Yield Method to Addressing Incidental Findings in Trauma Patients

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Authors
Background

Researchers have been testing the effectiveness of new techniques to increase the reporting of incidental findings in trauma patients.

In this study we:

- Report the incidence of incidental findings in a suburban trauma center treating primarily blunt and elderly trauma.
- Propose simple solutions to increase the rate of disclosure to patients.

Results

Table 1 – Patients, Cts, and Incidental Findings in the Pre-Intervention Arm Stratified by Age

<table>
<thead>
<tr>
<th># of Patients</th>
<th># of Cts</th>
<th># of Incidental Findings</th>
<th># of Patients with Incidental Findings</th>
<th>Mean # of Incidents per Patient</th>
<th># of Patients with Significant Incidental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>674</td>
<td>2533</td>
<td>1273</td>
<td>456 (70%)</td>
<td>1/3 (33%)</td>
</tr>
<tr>
<td>&lt;65</td>
<td>292 (43%)</td>
<td>1104</td>
<td>504</td>
<td>156 (51%)</td>
<td>1/0 (0%)</td>
</tr>
<tr>
<td>≥65</td>
<td>382 (57%)</td>
<td>1429</td>
<td>969</td>
<td>300 (79%)</td>
<td>2/5 (40%)</td>
</tr>
</tbody>
</table>

Table 2 – Categorized Significant Incidental Findings

<table>
<thead>
<tr>
<th>Type of SIF</th>
<th># of Incidents Pre</th>
<th># of Total Incidents Pre</th>
<th># of Incidents Post</th>
<th># of Total Incidents Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Nodules, Lesions</td>
<td>90</td>
<td>23%</td>
<td>72</td>
<td>22%</td>
</tr>
<tr>
<td>Mammalian</td>
<td>53</td>
<td>10%</td>
<td>52</td>
<td>16%</td>
</tr>
<tr>
<td>Thyroid Nodules, Lesions</td>
<td>39</td>
<td>10%</td>
<td>16</td>
<td>5%</td>
</tr>
<tr>
<td>Thyrotoxins</td>
<td>22</td>
<td>6%</td>
<td>20</td>
<td>6%</td>
</tr>
<tr>
<td>Adrenal Nodules, Lesions</td>
<td>18</td>
<td>5%</td>
<td>20</td>
<td>6%</td>
</tr>
<tr>
<td>Liver Lesions, Lesions</td>
<td>18</td>
<td>5%</td>
<td>13</td>
<td>4%</td>
</tr>
<tr>
<td>Other Suspicious Lesions</td>
<td>12</td>
<td>3%</td>
<td>15</td>
<td>5%</td>
</tr>
<tr>
<td>Adrenal Cyst, Lesions</td>
<td>12</td>
<td>3%</td>
<td>15</td>
<td>5%</td>
</tr>
<tr>
<td>Pancreatic Lesions</td>
<td>12</td>
<td>3%</td>
<td>15</td>
<td>5%</td>
</tr>
<tr>
<td>Mass, Dilatation, Cyst</td>
<td>11</td>
<td>3%</td>
<td>13</td>
<td>4%</td>
</tr>
<tr>
<td>Brain Lesions</td>
<td>10</td>
<td>3%</td>
<td>13</td>
<td>4%</td>
</tr>
<tr>
<td>Bone Lesions</td>
<td>10</td>
<td>3%</td>
<td>13</td>
<td>4%</td>
</tr>
<tr>
<td>Testicular, Sertoli Lesions</td>
<td>9</td>
<td>2%</td>
<td>8</td>
<td>2%</td>
</tr>
<tr>
<td>Bladder Thickening, Mass, Hydrourekthesis</td>
<td>9</td>
<td>2%</td>
<td>8</td>
<td>2%</td>
</tr>
<tr>
<td>Other (Breast, Soft Tissue, Misc. Facial)</td>
<td>54</td>
<td>14%</td>
<td>49</td>
<td>15%</td>
</tr>
</tbody>
</table>

Revenue Generated in F/U Imaging:

$37,119 for three months, or approximately $150,000/yr for Trauma

New Malignancies Detected:

- 20 new malignancies and 5 new metastasis, or approximately 100 patients/yr (4%)

Methods

- Pre-Intervention:
  - Retrospective chart review from Oct 1st 2015 to March 31st 2016
  - All charts hand-reviewed by investigators
  - Age, # of CT scans, type of Cts, # of incidental findings, category of incidental finding, if radiology recommended follow up, and if the patient was informed of the finding
  - Category 1 and 2 Incidental Findings were considered significant (requiring follow up prior to discharge or interval follow up); Category 3 were clinically insignificant
  - Implementation of Multi-Disciplinary Systems Changes
    - Radiology driven changes
    - Informatics driven changes
    - Standardized protocol for trauma residents/front-line providers
    - Utilization of existing work-flows for patient & primary communication
- Post-Intervention:
  - Retrospective chart review from Sept 1st 2016 to Nov 30th 2016
  - Data collected in same fashion as pre-intervention
  - Additional stratification including follow up revenue from CMS reimbursement, if patient had known about significant incidentals, and new diagnoses of malignancy per three month period

Conclusion

- Previous studies in urban trauma populations demonstrated a rate of incidental findings from 15-50%. This study shows that this is a significant underestimation and is not likely reflective of the vast majority of trauma centers that treat primarily blunt/elderly trauma.
- Simple systems based changes can be implemented with minimal amount of resources and effort. These changes will not only have a profound impact on improving reporting of incidentals to patients, but also generate additional hospital revenue, protect providers from medico-legal ramifications of failing to disclose, and most importantly improve patient care. This method is not limited to trauma surgery and can be applied to any service.
- Further iterations and innovations are needed to refine this process and define the most cost-efficient method of ensuring patients are aware of incidental findings in their imaging studies.

Acknowledgements / Select References

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