The Effect of Using the Summary Code in ED CT Radiology Reports on the Compliance Rate of Recommended Follow-up Studies

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Authors & Disclosure:

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Background: Current State

- A large number of CT scans are ordered by the ED daily to triage & manage patients.
- Complex reports and ambiguous verbiage
  - Can delay treatment & cause harm
  - Can lead to incomplete transition of care
- Recommendations for further evaluation of unexpected findings may not be performed
- Multiple studies showed that majority of incidental findings on CT scans lack appropriate follow-up due to uncertainty of recommendation from the radiologists’ end.
Proposed Summary Code for Future ED CT Reports:

- **SC1** – Negative or significant findings are unlikely.
  - No recommendation for further imaging evaluation is indicated.
- **SC2** – Findings of potential importance
  - *Further evaluation will likely be needed.*
  - Follow-up is not necessary for this episode of care.
- **SC3** – Findings of potential clinical significance.
  - Follow-up recommended, likely require further imaging or clinical diagnostic evaluation in the acute setting to determine significance.
- **SC4** – Diagnostic positive results: [indicate finding].
- **SC5** – Critical finding; specialty care providers will define a clinical management plan without further imaging evaluation.
Methods

- Single-center, cross-sectional follow-up of a prospective study.
- Inclusion criteria:
  - Patients requiring a CT while visiting the ED from 8/1/2016-10/31/2016
- Exclusion criteria:
  - CTAs
  - Pregnancy
  - <18 years of age
Outcome measures:

- Independent evaluation by radiologists/residents and ED physicians
- All CT’s receiving a SC2 or SC3 code prospectively or retrospectively assigned a SC2 or SC3 code if one was not given.
- Clinical success defined as:
  - Assigned code SC2 or SC3, and
  - Received recommended study within one-year from date of recommendation
- Chi-square and ANOVA tests were performed.
Comparison: Compliance

**Coded**
Total: 2756 cases

**Experimental Group:**
SC2 (f/u later) & SC3 (f/u now): 455

- Coded => Follow-up: 220 (48.3%, p<0.001)
- Coded => NO Follow-up: 235 (51.6%, p<0.001)

**Control Group:**
rSC2 & rSC3: 198

- No code: 1222 cases
- Retrospective coding
- Not Coded => Follow-up: 40 (20.2%, p<0.001)
- Not Coded => NO Follow-up: 158 (79.8%, p<0.001)
## Compliance: Patient factors

![Compliance: Patient factors](image)

<table>
<thead>
<tr>
<th>Insurance</th>
<th>Coded =&gt; Follow-up</th>
<th>Coded =&gt; NO Follow-up</th>
<th>Not Coded =&gt; Follow-up</th>
<th>Not Coded =&gt; NO Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicare</td>
<td>31%</td>
<td>34%</td>
<td>36%</td>
<td>34%</td>
</tr>
<tr>
<td>Medicaid</td>
<td>31%</td>
<td>30%</td>
<td>30%</td>
<td>31%</td>
</tr>
<tr>
<td>Private</td>
<td>33%</td>
<td>35%</td>
<td>32%</td>
<td>32%</td>
</tr>
<tr>
<td>Self-pay</td>
<td>5%</td>
<td>1%</td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Underserved</strong></td>
<td><strong>45%</strong></td>
<td><strong>73%</strong></td>
<td><strong>46%</strong></td>
<td><strong>77%</strong></td>
</tr>
<tr>
<td>Zip codes</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>p&gt;0.05</strong></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td><strong>p&lt;0.05</strong></td>
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</tr>
</tbody>
</table>

220 (48.3%, p<0.001)  
235 (51.6%, p<0.001)  
40 (20.2%, p<0.001)  
158 (79.8%, p<0.001)
## Compliance: Patient factors

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Coded =&gt; Follow-up</th>
<th>Coded =&gt; NO Follow-up</th>
<th>Not Coded =&gt; Follow-up</th>
<th>Not Coded =&gt; NO Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Female</td>
<td>54%</td>
<td>52%</td>
<td>53%</td>
<td>51%</td>
</tr>
<tr>
<td>Average age</td>
<td>58 years</td>
<td>56 years</td>
<td>57 years</td>
<td>56 years</td>
</tr>
<tr>
<td>Ethnic origin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>65%</td>
<td>61%</td>
<td>64%</td>
<td>60%</td>
</tr>
<tr>
<td>Black</td>
<td>14%</td>
<td>12%</td>
<td>15%</td>
<td>13%</td>
</tr>
<tr>
<td><strong>Hispanic</strong></td>
<td><strong>17%</strong></td>
<td><strong>27%</strong></td>
<td><strong>18%</strong></td>
<td><strong>27%</strong></td>
</tr>
<tr>
<td></td>
<td><em>(p&lt;0.05)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>4%</td>
<td>0%</td>
<td>3%</td>
<td>0%</td>
</tr>
</tbody>
</table>

220 (48.3%, p<0.001) 235 (51.6%, p<0.001) 40 (20.2%, p<0.001) 158 (79.8%, p<0.001)
Interdepartmental Differences in Interpretation of CT Recs*

- All agree: 48% (p<0.05)
- Radiologists agree with each other: 79% (p<0.05)
- But disagree w ED: 31%
- At least one radiologist disagrees with ED: 53%

- When given a prior code, ED disagrees with both radiologists: 3% (p<0.05)

*Using 100 cases with positive findings that are potentially ambiguous
Study Strengths & Weaknesses:

- Cross-sectional follow-up of prospective study
- Compared variability in interpretation of results by at least two practicing radiologists
- Contrast variability in interpretation of same results by practicing ED physicians
- Demographics prove minimal potential confounders (age, gender, ethnic origin* and insurance).

- Retrospective control group with potential selection bias
  - Addressed by having 2 investigators evaluating each study.
  - If both agree, the code was recorded as such
  - If no agreement, third investigator would break the tie

- Follow-up study is not necessarily more readily available everywhere as demonstrated by underserved areas.
- Hispanic patients having a non-proportionally higher percentage of no follow-up.
Discussion:
Healthcare consideration

- Growing trend.
- BI-RADS success, now liver and prostate.
- Standardized summary lexicon for ED reporting of CT results may achieve:
  - Clear interdepartmental communication
  - Clear provider-patient instructions
  - Clear inpatient-outpatient transition of care
- To maximize patient satisfaction and care
Discussion:
Non-healthcare consideration

- Ethical considerations
  - Medical justice vs personal impact of cancer
  - White Paper of the ACR Incidental Findings Committee JACR, 2010;7(10)754-73

- Legal/Malpractice consideration
  - No follow-up of potential cancerous findings
  - Average malpractice settlement: $2-3 millions/case

- Business consideration:
  - Tax-deduction for providing care in HPSA
  - Loss revenue from follow-up studies
Addressing Health Disparities:

- To Whom It May Concern
  - “With growing numbers of patients accessing their radiology reports, it matters more than ever what you say…”
  - “The ultimate goal should be to create a patient-facing report in a format that is both easy to understand and visually appealing to patients.”
    - ACR Bulletin, 2017;72(12)10-12

- To encourage follow-up amongst Hispanic patients, including the following statement may help:
  - “Hay hallazgos en este informe que su médico debe seguir. Si no puede pagar la prueba de seguimiento, comuníquese con nuestro asesor de _____ Hospital.”
References:


