Our approach focuses more on medical terms during generation.

Our approach improves completeness without sacrificing readability or accuracy.

Our approach significantly outperforms others with ROUGE.

Existing approaches often miss important findings.

**Medical Ontologies**

**UMLS**

Organized hierarchically

**RadLex**

RadLex term ontology

**Dataset**

4% real radiology reports from MedStar Georgetown University Hospital

80-10-10 train-dev-test splits

100 reports used for manual evaluation

**Task: Generate radiology summary from findings**

**STEP 1**

encode all findings into vector via RNN

**FINNINGS**

Postoperiative changes of right total knee arthroplasty. Mild lucency around the proximal tibia component and cement bone interface, measuring up to 4 mm. No acute displaced fracture. Diffuse bony demineralization.

**STEP 2**

extract terms from ontology

**STEP 3**

encode ontology terms into ontology vector via RNN, attention weighted from findings RNN output

**STEP 4**

include ontology vector decoding process concatenated with state vector in decoder gates

IMPORTANT FINDINGS

Postoperiative changes of right total knee arthroplasty. Mild lucency around the proximal tibia component and cement bone interface, measuring up to 4 mm. No acute displaced fracture. Diffuse bony demineralization.

**Attention weight comparison between our model and unmodified pointer-generator.**

**Our approach improves completeness without sacrificing readability or accuracy.**

**Our approach significantly outperforms others with ROUGE.**

**Table 1**

<table>
<thead>
<tr>
<th>Method</th>
<th>ROUGE-1</th>
<th>ROUGE-2</th>
<th>ROUGE-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background PG [3]</td>
<td>36.95</td>
<td>22.37</td>
<td>35.68</td>
</tr>
<tr>
<td>Pointer-Generator (PG) [4]</td>
<td>37.17</td>
<td>22.36</td>
<td>35.45</td>
</tr>
<tr>
<td>UMLS PG (ours)</td>
<td>37.98</td>
<td>23.14</td>
<td>36.67</td>
</tr>
<tr>
<td>RadLex PG (ours)</td>
<td>38.42</td>
<td>23.29</td>
<td>37.02</td>
</tr>
</tbody>
</table>


