DICOM and the Future of Medicine

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– representing the American College of Radiology (ACR)
This presentation explores DICOM’s impact on clinical medical practice – today and tomorrow

- Why do physicians work on DICOM?
- How can DICOM improve medical practice?
Radiology Reporting

An international effort
- Led by the Radiological Society of North America (RSNA)
- Soon to include the European Society of Radiology (ESR)

Goals
- Improve the communication of radiology procedures
- Allow “data mining” of radiology results
Radiology Reporting

- **Library of “best practice” templates**
  - RadReport.org

- **Standard for report templates**
  - Integrating the Healthcare Enterprise (IHE)
  - “Management of Radiology Report Templates” (MRRT) profile
The RSNA radiology reporting initiative is improving reporting practices by creating a library of clear and consistent report templates.

Supported in part by the National Institute of Biomedical Imaging and Bioengineering (NIBIB).

<table>
<thead>
<tr>
<th>Specialties</th>
<th>Organizations</th>
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</thead>
<tbody>
<tr>
<td><strong>Cardiac Radiology</strong></td>
<td>CT Cardiac Bypass Graft · 7 more</td>
</tr>
<tr>
<td><strong>Chest Radiology</strong></td>
<td>MR Brachial Plexus · 17 more</td>
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<tr>
<td><strong>Computed Tomography</strong></td>
<td>CT Spine · 41 more</td>
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<tr>
<td><strong>Diagnostic Radiology</strong></td>
<td>Ankle Xray · 28 more</td>
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<tr>
<td><strong>Emergency Radiology</strong></td>
<td>Abdomen Series · 18 more</td>
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<td><strong>Gastrointestinal Radiology</strong></td>
<td>Abdomen Series · 30 more</td>
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<td><strong>Genitourinary Radiology</strong></td>
<td>US Peds Renal Doppler · 23 more</td>
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<td><strong>Head and Neck</strong></td>
<td>CT Orbits · 9 more</td>
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<td><strong>Interventional Radiology</strong></td>
<td>US Thoracentesis · 5 more</td>
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<td><strong>Magnetic Resonance Imaging</strong></td>
<td>MR Brachial Plexus · 35 more</td>
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<td><strong>Musculoskeletal Radiology</strong></td>
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<td>CT Orbits · 22 more</td>
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<td><strong>Nuclear Medicine</strong></td>
<td>Bladder Reflux · 20 more</td>
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<td><strong>Obstetric/Gynecologic Radiology</strong></td>
<td>MR Female Pelvis · 5 more</td>
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<td><strong>Oncologic Imaging</strong></td>
<td>CT Onco Renal Mass · 21 more</td>
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<td><strong>Pediatric Radiology</strong></td>
<td>US Peds Renal · 12 more</td>
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<td><strong>Quality Improvement</strong></td>
<td>IR Complications · 1 more</td>
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<td><strong>Research</strong></td>
<td>CT Head and Neck Cancer Staging (ACRIN 6685) · 4 more</td>
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<tr>
<td><strong>Ultrasound</strong></td>
<td>US Peds · 1 more</td>
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<tr>
<td><strong>Vascular Imaging</strong></td>
<td>MR Neck · 8 more</td>
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</table>
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**Radiology Reporting Initiative**
July 21, 2014 11:43 am

**Number of Templates**: 265

**Number of Views/Downloads**: 1,319,404

**Distribution by Template Language**

- **English**: 218
- **Turkish**: 23
- **Chinese**: Other

**Most Viewed Templates**

1. Chest Xray (24,877 views)
2. CT Brain (19,486 views)
3. US Abdomen (16,619 views)
4. Chest Xray - 2 Views (14,469 views)
5. MR Brain (13,050 views)
6. MR Knee (12,301 views)
7. CT Chest Pulmonary Embolism (12,287 views)
8. CT Chest (11,983 views)
9. CT Neck (11,540 views)
10. CT Abdomen-Pelvis (11,206 views)
Findings

Heart
  - Normal

Lungs
  - No acute disease
    - [Mild biapical scarring is unchanged.]

Bones
  - Degenerative changes
    - [Unchanged.]
  - [The pacemaker is unchanged.]
Why Templates?

• Reduce variability of reports
  • Improve completeness
  • Encourage best practices
• Improve interoperability
• Support automation of report production
• Support validation of report content
• Promote data extraction
### Kemik Yaşı

<table>
<thead>
<tr>
<th>Impression (RID13170)</th>
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<tbody>
<tr>
<td>Normal (RID13173)</td>
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</tbody>
</table>

"Normal kemik yaş, kronolojik yaş 2 standart sapma içinde"

- Normal
- İleri
- Gecikmiş

- [_____]

- [_____]

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### Chinese

骨龄

- 正常
- 超过的
- 落后的

- [_____]

- [_____]

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"正常的骨龄与正常时间年龄在2个标准偏差以内"
Multiple layers of constraint

Professional Content
Specific content for specialized procedures

DICOM (Sup 155)
Additional requirements, templates, and business names for radiology reports

CDA r2
Refined Data Classes and structures for clinical documents

HL7 v3 RIM
Abstract Data Classes

v3 XML ITS
Data Encoding

Courtesy of H. Solomon
New “Work Item”

- Proposed to DICOM Standards Committee
- Assigned to Work Group 8 (Structured Reporting)
  - Harry Solomon (GE Healthcare), co-chair
  - Charles Kahn (ACR), co-chair
DICOM Supplement 155

- Defines how radiology reports are exported into HL7 Clinical Document Architecture (CDA)

- CDA provides a universal format for clinical results
  - Integrates radiology results with entire health record
  - Allows “data mining” for research and quality improvement
Why do physicians work on DICOM?

- Technical expertise
- Advocacy and communication with physician communities
- Contribution to international effort
How can DICOM improve medical practice?

- Standards foster competition to create better products
- DICOM helps advance the worldwide adoption of new medical imaging technology
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谢谢