TOO MUCH INFORMATION?

A clinical audit on patient access to digital record system and discrepancies between clinical notes and radiology reports causing potential harm to pediatric scoliosis patients

Presenter: Sana Rashid, BSc
Kelly Ainsworth DC, MD, FRCPC

1Michael G. DeGroote School of Medicine, McMaster University
2McMaster Children’s Hospital Diagnostic Radiology Department

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Introduction

- The gold standard for measuring scoliosis curves is the Cobb Method, however like all radiographic measurements, it is still subject to measurement error.
- Pediatric scoliosis patients at McMaster Children’s Hospital are cared for by orthopedic surgery and receive serial radiographic assessments after a baseline radiograph to assess progression of the curve.
- A difference in scoliosis measurements of 5° or less from baseline or previous is considered “stable” or “unchanged” and attributed to measurement error.
Introduction

• At Hamilton Health Sciences, there has been a recent switch to using EPIC as the EMR, and patients now have online access to their medical records via MyChart
  ▪ Pediatric scoliosis patients are presented with 2 sources of information: the orthopedic clinic note and the radiology report

• Radiologists and Orthopedic Surgeons know a 5° measurement difference is insignificant, but patients do not: previous studies have shown these discrepancies can pose emotional harm to patients.

• Our goal was to perform a clinical audit to assess discrepancies in scoliosis measurements between the orthopedic clinic note and the radiology report
Methods

• Search Parameters
  • All XR Scoliosis Surveys from July 2022 to September 2022
  • Patients < 18 years old

• Exclusions
  • Post-surgical patients
  • Curves described as “kyphosis”
  • Studies that did not include specific measurements in the radiology report and orthopedic clinic note

• Data Collected
  • Patient age and date of scoliosis measurement
  • Vertebral levels of curves
  • Upper, middle, and lower measurements of curves on radiology report
  • Upper, middle, and lower measurements reported in orthopedic clinic note
Results – # of studies where measurements differed more than 5°

- A total of 162 radiographs were reviewed of which 121 met our inclusion criteria.
- Demographics
  - Ages ranged between 5 – 17 years old
  - Mean age of 14.34 years old
  - 33 males and 88 females
- In 54.5% of studies (66 of 121) the measurement on the radiology report and orthopedic clinic note differed by greater than 5°.
Results - # of studies with additional discrepancies between reports

- Of the 66 studies with discrepancies larger than 5°, 35 had additional discrepancies in reported vertebral levels or a difference in the number of curves reported.
Results – Mean discrepancies reported for upper, middle and lower curves

<table>
<thead>
<tr>
<th>Curve</th>
<th>Range of Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper</td>
<td>5.6° - 20°</td>
<td>9.85°</td>
</tr>
<tr>
<td>Middle</td>
<td>5.2° - 10.6°</td>
<td>6.79°</td>
</tr>
<tr>
<td>Lower</td>
<td>7.5° - 19°</td>
<td>13.25°</td>
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</tbody>
</table>
Discussion

• Despite assessing the same radiograph, a large proportion of the Cobb angles differed between the radiology report and the orthopedic clinic note beyond the 5° accepted standard measurement error.

• Measurement differences can be explained by equipment and context (time):
  • Radiologists use dedicated imaging-review PACS workstations with high resolution monitors and accurate measurement tools in reporting rooms.
  • Orthopedic Surgeons use clinic issued standard resolution PC monitors in hectic clinics with the patient in real-time.
Discussion

• Differences between the radiology report and the orthopedic clinic note have always existed, but patients were unaware and for the reasons above, were usually clinically unimportant

• However if treatment change hinges on specific measurement thresholds, this creates potential confusion and anxiety for patients and their families
  • Even small differences in reports have previously been shown to induce anxiety in patients

• Can also increase the burden on physicians that may have to spend more time reassuring patients
  • In one study, 84% of physician respondents reported increased phone calls from patients after being given access to radiology reports
Next Steps

• Consider inclusion of educational disclaimers at the end of reports on:
  • Acceptable measurement error
  • Reminder that this information is to be used in conjunction with their Orthopedic Surgeon’s clinical assessment

• Conduct additional studies to investigate *actual* impact on patients.

• In view of > 50% cases exceeding allowable 5° measurement difference:
  • Liaise with Orthopedic Surgeons to gauge patient *feedback*, review standard measurement protocol to *improve consistency*.
  • Review *assumption* that despite accepting a degree of measurement difference between Radiologists and Orthopedic Surgeons, that *actual clinically significant change from baseline* will be equally recognized by both services.