AOC 2015 Charleston, SC. Chris Kubycheck EOS

Disclaimer- The Following information is based on the capturing of 36,500 images and how EOS compared to Plain Film DR.
Conflict of Interest Statement

None that are work related
What is EOS

- full-body radiographic image of patients in functional positions.
How is EOS Different

• Low Dose
  • The radiation dosage is 50 percent to 85 percent less than DR.
• Fast
• Captures AP/Lateral in one pass
• Minimized Refraction
• No Stitching
### Results: Organ dose

<table>
<thead>
<tr>
<th>Organ</th>
<th>Dose EOS</th>
<th>Dose DR</th>
<th>Ratio</th>
<th>Dose CR</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active bone marrow</td>
<td>63 µGy</td>
<td>393 µGy</td>
<td>6.2</td>
<td>466 µGy</td>
<td>7.4</td>
</tr>
<tr>
<td>Breasts</td>
<td>59 µGy</td>
<td>439 µGy</td>
<td>7.4</td>
<td>583 µGy</td>
<td>9.9</td>
</tr>
<tr>
<td>Colon (Large intestine)</td>
<td>50 µGy</td>
<td>283 µGy</td>
<td>5.7</td>
<td>429 µGy</td>
<td>8.6</td>
</tr>
<tr>
<td>Lungs</td>
<td>93 µGy</td>
<td>483 µGy</td>
<td>5.2</td>
<td>680 µGy</td>
<td>7.3</td>
</tr>
<tr>
<td>Ovaries</td>
<td>51 µGy</td>
<td>262 µGy</td>
<td>5.1</td>
<td>340 µGy</td>
<td>6.6</td>
</tr>
<tr>
<td>Uterus</td>
<td>44 µGy</td>
<td>231 µGy</td>
<td>5.3</td>
<td>305 µGy</td>
<td>7</td>
</tr>
<tr>
<td>Thyroid</td>
<td>49 µGy</td>
<td>381 µGy</td>
<td>7.8</td>
<td>364 µGy</td>
<td>7.4</td>
</tr>
<tr>
<td>Urinary bladder</td>
<td>35 µGy</td>
<td>192 µGy</td>
<td>5.5</td>
<td>275 µGy</td>
<td>7.8</td>
</tr>
</tbody>
</table>
Types of images

EOS® technology provides true to size images, in 1:1 scale, for surgical planning and monitoring of bone and joint diseases.

This revolution was born with EOS®.

Diagnostic errors from digital stitching of scoliosis images – the importance of evaluating the source images prior to making a final diagnosis

Nucharin Supakul · Keith Newbrough · Mervyn D. Cohen · S. Gregory Jennings
Effects of DR Stitching vs EOS Scan
Indications for Use

510(k) Number (if known): K123740
Device Name: EOS

- The EOS is intended for use in general radiographic examinations
- Excluding the evaluation of
  - lung nodules
  - Mammography
Comparing EOS with DR & CR X-Ray
- Found image quality to be comparable or better with EOS overall.
- Radiation dose was considerably lower with EOS.
- Patient throughput impacts cost effectiveness of EOS.
- The average cost per procedure of EOS decreases with utilization.

Conclusion
- Given the higher cost of an EOS machine, utilization is the major determinant of cost-effectiveness. Estimates of patient throughput at national level suggest that EOS is not cost-effective.

FUNDING:
The National Institute for Health Research Health Technology Assessment program.
Benefit to Providers Based on Discipline

**High Benefit**
- Adult Reconstruction (hips & knees)
- Pelvic Preservation
- Spine
  - Deformity
  - Degenerative
  - Instrumentation / Fusion

**Low Benefit**
- Foot and Ankle
- Shoulder Reconstruction / Replacement
- Operative Sports
- Non-Operative Sports
- Ortho Sarcoma
- Hand
- Trauma
Application Matrix for EOS

- No Go
- Workable
- Home Run
No Go Zone

- Wrist
- Shoulder
- Clavicle
- Chest
- Elbow
- Knee (based on views)
- Feet and Ankle
Not okay to do in EOS
Not okay to do in EOS
Workable Zone

• Cervical Spine
• Lumbar Spine
  – Flex / Ext
• Cup
• Femur
Home Run Zone

- Deformity
- Sagittal Balance
- Limb Length
Home Run
Unicorn
EOS imaging in summary

**Upper Extremity:** 100%

**All Imaging:**
- Upper Extremity: 24%
- Lower Extremity: 5%
- Spine: 71%

**Lower Extremity:**
- Upper Extremity: 5%
- Lower Extremity: 75%

**Spine:**
- Upper Extremity: 26%
- Lower Extremity: 74%

**Pelvis:**
- Upper Extremity: 98%
- Lower Extremity: 2%
Challenges

Financial
Higher cost of purchase
Higher service contract
No Differential Reimbursement

Operational
• Local Service Support
• Appropriate Case Volume
• Technician Training
• Radiologists Interpretation
• Incidental Findings
Disclaimer

• Please note that this study was performed on the EOS machine for the purpose of assessing hardware alignment only. This technique involves decreased spatial resolution and detail, and may decrease the sensitivity for detecting pathology.