The Image Gently Alliance: Where We Have Been, and Where we Are Going

The Alliance for Radiation Safety in Pediatric Imaging

Donald P. Frush, MD

No disclosures
Image Gently

- Strategic plan: finalized March 2015
- New mission and vision statements
- Community practice representation
  - Luke Person, MD
- Image Wisely representation
  - William Mayo-Smith, MD
- Administrative changes
- Increased funding by SPR
- Continued review of broad range of documents
Comments on The Joint Commission revisions (for 7/15)

Proposed Revisions to Diagnostic Imaging Standards
Ambulatory Care Accreditation Program

HR.01.02.05
The organization verifies staff qualifications.

Elements of Performance for HR.01.02.05
1. When law or regulation requires care providers to be currently licensed, certified, or registered to practice their professions, the organization both verifies these credentials with the primary source and documents this verification when a provider is hired and when his or her credentials are renewed. (See also HR.01.02.07, EP.2)
2. Note 1: It is acceptable to verify current licensure, certification, or registration with the primary source via a secure electronic communication or by telephone. If this verification is documented.
3. Note 2: A primary verification source may designate and/or information. The designated agency can then be used as an external organization (for example, a credentialed individual) to verify credentials information. A CVO must maintain a Glosary.

Proposed Revisions to Diagnostic Imaging Standards

1. These comments are primarily directed at the pediatric population but may apply to patients outside of the pediatric age group as well. Without the previous proposed revisions, it is difficult to understand what the entire proposed revisions are; what might have been modified based on prior input, what might have been eliminated or added. This information is critical in deciding in what context the current draft should be viewed. It will be necessary to have relevant organizations have an opportunity to review and comment on the comprehensive proposal as soon as possible.

2. There should be accountability for radiation dose estimations and adjustment prior to imaging (case by case and/or adherence to appropriate protocol); the emphasis on recording after the fact alone is insufficient for patient dose management.

3. Cone beam CT:
   a. Why is dental use excluded?
Image Gently Alliance

- Alliance now more than 1,000,000 professionals
- > 90 organizations/societies
RSNA 2014: 8th IG Alliance meeting!
<table>
<thead>
<tr>
<th>IG “impact”</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visits</td>
<td>411,563</td>
<td>582,520</td>
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<tr>
<td>Pledgers</td>
<td>21,396</td>
<td>28,779</td>
</tr>
<tr>
<td>CT protocols</td>
<td>34,416</td>
<td></td>
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Welcomed
16 NEW Organizations since Jan 2014

European Academy of Dento-Maxillo-Facial Radiology
American Association of Oral Maxillofacial Surgeons
American Academy of Periodontology
American Academy of Pediatric Dentistry
American Association of Endodontics
Canadian Association of Oral and Maxillofacial Radiology
American Dental Association
American Association of Dental Assistants
American Academy of Oral and Maxillofacial Pathology
American Dental Education Association
Pediatric Orthopedic Society of North America
American Dental Hygienists Association
International Association of Dento-Maxillo-Facial Radiology
FDI World Dental Federation
Canadian Dental Hygienists Association
American Association of Dental Consultants
Image Gently Activities

- Image Gently in Dentistry Campaign
- ALARA supplement: February 2014 meeting
- Image Gently “universal” protocols
- AAPM work group head protocols
- MITA fluoroscopic technical and education documents
- Advocacy
  - Joint Commission input: 2015 Diagnostic Imaging Standards
  - New York State block grant project
  - Letter to Consumer Report
  - International Day of Radiology (IDoR) 2015
  - EuroSafe, AfroSafe initiatives
Image Gently Activities

- International meetings with WHO, WFPI – Africa, Japan, Italy, Brazil
- SNMMI intern Dr. Neha Kwatra
- Nuclear medicine alignment with European guideline
Image Gently in Dentistry
Steering Committee

Joanna Douglass, BDS, DDS
Alan Farman, BDS, PhD, DSc
Joel Gray, PhD
Clarice Law, DMD, MS
Marty Levin, DMD
Evelyn Lucas-Perry, DDS, MPH
Anthony Palatta, DDS, EdD
Bob Pizzutiello, MS
Robert Sauer, MS
David Smith, PhD
Stuart White, DDS, PhD
Gail Williamson, RDH, MS
Richard Valachovic, DMD, MPH
Greg Zeller, DDS, MS

Alan Lurie, DDS, PhD
Chair, Image Gently in Dentistry

image gently®
Campaign Justification

- Doses in dental imaging are relatively low
- 500 million intra oral, bitewing, full mouth in 2006
- 2x the # of conventional x-rays and fluoro combined
- Range of dose (full mouth): 34 microSv to 388 microSv
- Conebeam CT
  - # of units will likely surpass standard CT
  - 10,335 units in 2007
  - dose range 20 microSv to 500 microSv (4-10x lower than standard CT)
- ADA has 167,000 members
- ADHA (hygienists) has 40,000 of 185,000 nationwide
Image Gently in Dentistry

- Launched September 24, 2014
- 15 dental subspecialty groups including American Dental Association, ADHA
- Featured at 4 subspecialty meetings

(L-R): Robert Cederberg, DDS AAOMR President, Gail Williamson, RDH, Executive Director AAOMR and Alan Lurie, DDS, AAOMR Immediate Past President & Image Gently in Dentistry co-Chair at the 64th AAOMR meeting in Orlando, Florida.
One size does not fit all…

When using radiography during pediatric dental procedures remember:

- Select X-rays for individual needs, not as routine
- Use the fastest image receptor available
- Use cone-beam CT (CBCT) only when necessary
- Collimate beam to area of interest
- Always use thyroid shield
- Child-size the exposure time
Educational Resources

- Parent pamphlet
- www.imagegently.org
- Scientific articles (OOOO, JADA, Pediatric Dentistry)
- Free PowerPoint presentations on website
Guest Editorial

The Image Gently in Dentistry Campaign: Partnering with Parents to Promote the Responsible Use of X-Rays in Pediatric Dentistry

Many parents seem increasingly concerned about exposure of their children to radiation during periodic x-rays or imaging procedures. A recent report from the National Academy of Sciences, Engineering, and Medicine found that dental x-rays are the most common type of radiation exposure for most children and that the American Academy of Pediatrics recommends a maximum cumulative radiation dose of no more than 50 mSv per year for each child. In response, the American Dental Association (ADA) has launched the Image Gently campaign to promote the responsible use of x-rays in pediatric dentistry. The campaign encourages dentists to use the lowest radiation dose necessary for diagnostic purposes and to inform parents about the risks and benefits of x-ray procedures. The campaign also provides resources for dentists and parents, including an online resource center, educational materials, and a peer-to-peer network to support best practices in dental radiography. By promoting the responsible use of x-rays, the Image Gently campaign aims to help children receive high-quality dental care while minimizing their exposure to ionizing radiation.
Image Gently ALARA CT Meeting

- February 21, 22, 2014
- Orlando, Florida
- Hyatt Airport
- 141 participants
- 21 speakers
Gently ALARA Supplement

- 21 course faculty
- 30 lectures
- 9 pediatric radiologists
- 2 adult radiologists
- 8 medical imaging physicists
- 1 pediatrician
Image Gently
CT Radiographic Techniques

- First published in 2008
- Designed to deliver same patient dose regardless of patient size
- Manual mAs reductions only for
  - Head
  - Abdomen
  - Thorax

<table>
<thead>
<tr>
<th>Abdomen Baseline:</th>
<th>kVp</th>
<th>mA</th>
<th>Time (sec)</th>
<th>Pitch Abdomen</th>
<th>Pitch Thorax</th>
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</thead>
<tbody>
<tr>
<td>Baseline:</td>
<td>120</td>
<td>200</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>PA Thickness</td>
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<tr>
<td>cm</td>
<td></td>
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<td>31</td>
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<td>Approx Age</td>
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<tr>
<td>newborn</td>
<td>9</td>
<td>0.43</td>
<td>86</td>
<td>0.42</td>
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<td>1 yr</td>
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<td>102</td>
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<td>5 yr</td>
<td>14</td>
<td>0.59</td>
<td>118</td>
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<tr>
<td>10 yr</td>
<td>16</td>
<td>0.66</td>
<td>132</td>
<td>0.64</td>
<td>128</td>
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<tr>
<td>15 yr</td>
<td>19</td>
<td>0.76</td>
<td>152</td>
<td>0.73</td>
<td>146</td>
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<tr>
<td>small adult</td>
<td>22</td>
<td>0.90</td>
<td>180</td>
<td>0.82</td>
<td>164</td>
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<tr>
<td>med adult</td>
<td>25</td>
<td>1.0</td>
<td>200</td>
<td>0.91</td>
<td>182</td>
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<tr>
<td>large adult</td>
<td>31</td>
<td>1.27</td>
<td>254</td>
<td>1.16</td>
<td>232</td>
</tr>
</tbody>
</table>

mAs Reduction Factor (RF) = BL x RF
CT Radiographic Techniques

- Recommendations Needed:
  - Departments with multiple scanners
  - Different degrees of reduction
  - Use Size Specific Dose Estimate (SSDE)
  - Iterative reconstruction
  - Reduced tube voltage (kV)
  - Automatic Exposure Control (AEC)
# CT Radiographic Techniques

<table>
<thead>
<tr>
<th>Abdomen/ Pelvis:</th>
<th>kVp</th>
<th>mA</th>
<th>Time (sec)</th>
<th>Pitch During Measured CTDIvol</th>
<th>Pitch During Clinical Exam</th>
<th>Adult SSDE</th>
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</thead>
<tbody>
<tr>
<td>Pelvis:</td>
<td>120</td>
<td>140</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>16</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>AP Thickness (cm)</th>
<th>LAT Thickness (cm)</th>
<th>Effective Diameter (cm)</th>
<th>Mass (kg)</th>
<th>Age</th>
<th>Limited mAs Reduction Factor (1)</th>
<th>Moderate mAs Reduction Factor (0.75)</th>
<th>Aggressive mAs Reduction Factor (0.5)</th>
<th>Limited mAs SSDE</th>
<th>Moderate mAs SSDE</th>
<th>Aggressive mAs SSDE</th>
<th>Limited NB = Adult SSDE Estimated mAs</th>
<th>Moderate NB = 0.75 * Adult SSDE Estimated mAs</th>
<th>Aggressive NB = 0.5 * Adult SSDE Estimated mAs</th>
</tr>
</thead>
</table>
Dose indices: everybody wants a number

Keith J. Strauss

Developing patient-specific dose protocols for a CT scanner and exam using diagnostic reference levels

Keith J. Strauss
The Alliance for Radiation Safety in Pediatric Imaging

Fluoroscopic Vendor Matrix

Keith J. Strauss, MSc., FAAPM, FACR
Image Gently
Fluoroscopic Vendor Matrix

Image Gently: Hardware/Configuration Recommendations

for

Pediatric Fluoroscopic Imaging

Keith J. Strauss, MSc, FAAPM, FCR

Marilyn J. Goske, MD, FAAP
Image Gently Fluoroscopic Vendor Matrix

Image Gently and MITA Interventional Fluoroscopy Working Group (IWG)

Essential questions for consideration in the design of Interventional X-ray equipment intended for pediatric use
Image Gently
Fluoroscopic Vendor Matrix

AAPM Imaging Physics Committee
AAPM Fluoroscopy sub-committee
AAPM Pediatric imaging sub-committee
ACR: American College of Radiology
GE Healthcare
Image Gently
Medtronic Navigation
Philips Healthcare
Siemens Healthcare
Shimadzu Medical Systems
Toshiba America Medical Systems, Inc.
Ziehm Imaging, Inc.
# Image Gently

## Fluoroscopic Vendor Matrix

| Question b | Does the *air kerma* per frame change as a function of frame rate:  
|            | - Either resulting in a proportional *air kerma* rate reduction as a function of frame rate?  
|            | - Or resulting in a non-proportional *air kerma* rate reduction as a function of frame rate? |

| Rationale b | The *air kerma* per frame may automatically increase, for example according to equation 1, when the operator reduces the frame rate during pulsed FLUOROSCOPY from 30 to 7.5 frames per second. This change in dose per frame maintains a constant perceived noise level in the image [8].  

\[
\text{Increase in AK/frame} = \left(\frac{30}{\text{frame rate}}\right)^{0.5} \tag{1}
\]

Perceived noise in the image is impacted by the number of images averaged together by...
AAPM workgroup to standardize CT protocols and nomenclature
C. McCollough and D. Cody, Chairs

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AAPM WG Head CT protocols
using IG “universal protocols”
SPR CT committee

**Indications**
- Acute head trauma
- Child abuse
- Craniosynostosis/plagiocephaly
- Calvarial bone lesions (Langerhans cell histiocytosis, neuroblastoma, etc)
- Suspected acute intracranial hemorrhage;
- Immediate postoperative evaluation following brain surgery (evacuation of hematoma, a drainage, etc);
- Suspected shunt malfunctions, or shunt revisions if rapid brain MRI is not available;
- Increased intracranial pressure;
- Acute neurologic deficits;
- Suspected acute hydrocephalus;
- Brain herniation;
- Suspected mass or tumor;
- Non-focal seizures;
- Detection of calcification;

When magnetic resonance imaging (MRI) imaging is unavailable, contraindicated, or if a supervising physician deems CT to be most appropriate due to an urgent health situation, sedation is contraindicated.

---

### ROUTINE PEDIATRIC HEAD (BRAIN)

<table>
<thead>
<tr>
<th>PHILIPS</th>
<th>Brilliance 16 slice</th>
<th>Brilliance 64 channel</th>
<th>Ingenuity CT</th>
<th>Brilliance ICT SP</th>
<th>Brilliance ICT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scan Type</td>
<td>AXIAL</td>
<td>AXIAL</td>
<td>AXIAL</td>
<td>AXIAL</td>
<td>AXIAL</td>
</tr>
<tr>
<td>Rotation Time (s)</td>
<td>1.0</td>
<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
</tr>
<tr>
<td>Collimation</td>
<td>15 x 1.5 mm</td>
<td>16 x 0.625 mm</td>
<td>16 x 0.625 mm</td>
<td>18 x 0.625 mm</td>
<td>16 x 0.625 mm</td>
</tr>
<tr>
<td>mAs</td>
<td>1-2 yrs: 150</td>
<td>0-3 yrs: 135</td>
<td>0-3 yrs: 135</td>
<td>0-3 yrs: 115</td>
<td>0-3 yrs: 115</td>
</tr>
<tr>
<td></td>
<td>1-2 yrs: 135</td>
<td>1-2 yrs: 165</td>
<td>1-2 yrs: 165</td>
<td>1-2 yrs: 140</td>
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<tr>
<td></td>
<td>2-6 yrs: 215</td>
<td>2-6 yrs: 215</td>
<td>2-6 yrs: 105</td>
<td>2-6 yrs: 105</td>
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<tr>
<td></td>
<td>6-16 yrs: 315</td>
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<td>6-16 yrs: 235</td>
<td>6-16 yrs: 235</td>
<td>6-16 yrs: 235</td>
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<tr>
<td></td>
<td>16 yr+: 400</td>
<td>16 yr+: 350</td>
<td>16 yr+: 300</td>
<td>16 yr+: 300</td>
<td>16 yr+: 300</td>
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<td>Couch increment (cm)</td>
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<td>FOV (mm)</td>
<td>250</td>
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</tbody>
</table>

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### PEDIATRIC HEAD - ROUTINE (AXIAL) (selected PHILIPS scanners)

SURVIEW: Lateral, 120 kVp, 30 mA.

<table>
<thead>
<tr>
<th>GE</th>
<th>LightSpeed Ultra (6)</th>
<th>BrightSpeed 16 Select</th>
<th>LightSpeed 16 BrightSpeed 16</th>
<th>LightSpeed Pro 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scan Type</td>
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<td>AXIAL</td>
<td>AXIAL</td>
<td>AXIAL</td>
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<tr>
<td>Rotation Time (s)</td>
<td>2</td>
<td>2</td>
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<td>2</td>
</tr>
<tr>
<td>Detector Configuration</td>
<td>4 x 2.5 (10 mm, 2)</td>
<td>4 x 2.5 (10 mm, 2)</td>
<td>16 x 0.625 (10 mm, 2)</td>
<td>16 x 0.625 (10 mm, 2)</td>
</tr>
<tr>
<td>Pitch</td>
<td>-</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Table Feed/Interval (mm)</td>
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<td>10</td>
<td>10</td>
<td>20</td>
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<tr>
<td>kV</td>
<td>120</td>
<td>120</td>
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<td>120</td>
</tr>
<tr>
<td>mAs</td>
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<td></td>
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<td>SFOV</td>
<td>HEAD</td>
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</table>
Image Gently: Education and Training Recommendations for Manufacturers of Pediatric Fluoroscopic Imaging Equipment

Marilyn J. Osiek MD, FACR, FAAP
Keith J. Strauss MDc, FAAPM, FACR

This work was funded through a contract awarded to the Society for Pediatric Radiology/Alliance for Radiation Safety, Pediatric Imaging from the U.S. Food and Drug Administration (through its Critical Path program). However, no endorsement of this document by the Food and Drug Administration is intended or should be inferred. The information should be viewed as a possible starting point for discussions between manufacturers and end users on how to improve the design and instructions for fluoroscopy equipment to address pediatric radiation safety issues.
Met with education specialists at RSNA 2014

- 5 meetings to date

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Bryan May – Bryan.May@ziehm.com
Education and training recommendations for Pediatric
(MITA/IWG status as of 1st-Oct-2014)

Goal
• Disseminate the Image Gently fluoroscopy educational modules to equipment users and customers

Actions taken following last teleconference held in March 2014
• Create hyperlinks on each vendor’s adequate web pages* to IG web pages hosting the educational modules

….Above and Beyond
• Interventional fluoroscopy industry is engaged in all initiatives intended to reduce dose to patients and manufacturers representatives will present their initiatives related to education & training of physicians performing procedures on the pediatric population

*Disclaimer: The Image Gently web site is solely responsible for its content and by providing this link to the Image Gently website (insert your company name here) is not endorsing nor takes responsibility for or gives any guaranty to the validity of its content and has no affiliation with or to the Image Gently web site or content.
SmartDose - Best image quality. Minimum dose.

Ziehm Imaging has incorporated SmartDose in the current generation of mobile C-arms. This comprehensive concept for dose reduction allows the physician and staff to significantly reduce dose while optimizing image quality. SmartDose benefits both patients and staff alike. With savings up to 60%.

Ziehm imaging sets the benchmark in user-friendly adjustment of dose exposure.

Ziehm Imaging Inc. supports Image Gently’s efforts to create awareness for dose reduction for pediatric patients.

For more information visit www.imagengently.org*

* The Image Gently website is solely responsible for its content. By providing this link to the Image Gently website, Ziehm Imaging Inc. is not endorsing nor taking responsibility for or giving any guarantee to the validity of its content and has no affiliation with or to the Image Gently website or its content.

- ZAIP - Up to 20% less dose.
- ODDC - Up to 40% less dose.
- Pulse technology - Significant dose savings.
- PreMag - Radiation-free magnification.
- Low Dose - Up to 50% less dose.
- Laser positioning device - Exposure-free targeting.
- Auto LPK - Automated dose savings.
- Collimation - Dose saving while optimizing image quality.
- Organ programs - Optimized dose.
Welcome to the Toshiba Learning Center.

Through the Toshiba Learning Center (TLC) portal you can access a wealth of resources for both online and instructor-led courses. TLC offers 24/7 accessibility using an intuitive web-based design with self-registration, automatic tracking, and reporting of progress completion that make it simple to review at any time.

Latest News

Performance Learning

At Toshiba America Medical Systems, customer education is a daily, long-term commitment aimed at helping you keep pace with healthcare innovation.

Our newly designed website introduces Performance Learning, Toshiba’s customizable learning tracks using classroom courses, online courses, and an extensive library of reference materials. More than equipment training, we provide you with the tools to be successful in your practice.

Performance Plus

Performance Plus is anchored by Mediants. Designed by doctors for doctors, Mediants includes hundreds of lectures, as well as Thieme eRadiology content: 45,000 pages of textbook and journal information, and 93,000 downloadable images. Also, test yourself with Thieme RadCases – 2,350 interactive case studies. Hone diagnostic skills in many subspecialties.
Email Correspondence to Highlight Image Gently Training Modules and CE Credit Opportunity

Dedicated Pediatric “Leave Behind” [DRAFT]
Pediatric Web Page

Overview Tab

- Raise awareness on children sensitivity to radiation.

- Link toward Image Gently Website.

Leave behinds

- Includes all our recommendations about system optimization for Pediatric procedures.
- Checklist format.
- Plan to be downloadable from our Website.
Nuclear Medicine


- **Web-based tools for Pediatric Administered Activities and for Radiation Dose Calculations in the SNMMI Website** with inks to the **Image Gently Website** have been received enthusiastically. Apps that will work on smartphones and tablets are imminent. Adam Alessio, Fred Fahey and other colleagues from the SNMMI’s Dose Optimization Committee have spearheaded the effort. ([www.snmmi.org](http://www.snmmi.org)>Quality &Practice->Dose Optimization)

- **Poster of the 2014 Update of the NA guidelines.** Appeared in the JNNMI first page of the August issue. And will be published in the December issue of the JNMT
Poster: Update to the North American Guidelines

- Appeared in the first page of the J Nucl Med issue in August 2014
- Dec 2014 of JNMT
- **Adding more radiopharmaceutical administered activities to the North American Guidelines.** Mike Gelfand is leading a survey among pediatric institutions in order to achieve consensus among the hospitals surveyed. The number of radiopharmaceuticals listed should increase from 12 to 18. Mike’s goal is to present these results at the next SPR meeting.

- **Article accepted for publication in Pediatric Radiology** describing differences and similarities between the NA guidelines and the EANM guidelines (abstract was given the Caffey’s Award in the London IPR meeting). (Grant, et.al. “Radiation Doses for Pediatric Nuclear Medicine Studies: Comparing the North American Consensus Guidelines and the Pediatric Dosage Card of the European Association of Nuclear Medicine”, in press, Pediatric Radiology).

- **Reduction of administered activities in hepatobiliary scintigraphy in babies. Beyond the NA Guidelines.** Fahey, Zukotynski, Zurakowski, Falone, Vitello, Cao, Grant, Drubach, Vija, Bhattacharya, Bar-Sever, Gelfand, Treves. Reduction in Minimum Administered Radiopharmaceutical Activity with Preserved Diagnostic Image Quality in Pediatric Hepatobiliary Scintigraphy. Accepted for publication, published on-line ahead of print. EJNM, 2104

- **Effect of publication and dissemination of the NA guidelines in the practice of pediatric nuclear medicine.** Paper has been submitted for publication. A re-survey of the original 13 hospitals was recently conducted. The good news is that this survey showed that in general, pediatric radiopharmaceutical administered activities have been reduced. (Effects of Image Gently and the North American Guidelines: Administered Activities in Children at 13 North American Pediatric Hospitals, Fahey, Ziniel, Manion, Treves, Submitted for publication, 2014)
SNMMI.org - Dose Optimization

- SNMMI.org/dose
- Pediatric Injected Activity Tool

Pediatric Injected Activity Tool

Click Here to View Disclaimer

Nuclear Medicine Exams

- No selection
- F-18 FDG Body
- F-18 FDG Brain
- I-123 MIBG
- Tc-99m MDP
- Tc-99m DMSA
- Tc-99m MAG3 w/o Flow
- Tc-99m MAG3 with Flow
- Tc-99m IDA
- Tc-99m MAA with ventilation
- Tc-99m MAA without ventilation
- Tc-99m Pentetate
- F-18 NaF
- Tc-99m Cystography
- Tc-99m Sulfur Colloid Liquid
- Tc-99m Sulfur Colloid Solid

North American Recommendation:

According to the NA consensus guidelines, the recommended injected activity for a Tc-99m DMSA study for a 10.0 kg patient is 0.50 mCi (19 MBq). The EANM Dosage Card 2014 version administered activity may also be used.

EANM Recommendation:

According to the 2014 EANM Dose Card, the recommended injected activity for a Tc-99m DMSA study for a 10.0 kg patient is 0.50 mCi (19 MBq).

Patient Weight:

10.0 kg

www.snmmi.org/pedactivitytool
SNMMI.org - Dose Optimization

- SNMMI.org/dose
- Nuclear Medicine Radiation Dose Tool

### Nuclear Medicine Radiation Dose Tool

#### Select Nuclear Medicine Exam:

- F-18 FDC
- Tc-99m DMSA
- Tc-99m Per technetate
- Tc-99m MAA
- Tc-99m MDP
- Tc-99m MIBI
- Tc-99m Tetrofosmin

#### Recommended Adult Injected Activity:

- Minimum: 2.0 mCi (74.00 MBq)
- Maximum: 6.0 mCi (222.00 MBq)

#### Reference for adult injected activity:

GE Healthcare Package Insert, 2006

#### Input Injected Activity:

0.5 mCi or 19 MBq

#### Radiation Dose Estimate:

According to models recommended in ICRP 106, a 19 MBq injection for a Tc-99m DMSA study would impart to a 10-yr-old an approximate effective dose of 0.6 mSv (0.05 rem). The critical organ for this study is the kidneys, which would receive 5.5 mSv (0.55 rad).
Effect of 2010 NA Guidelines:
Administered Activities in Children at 13 North American Pediatric Hospitals

- Reduction of administered activities
- Variability in activity/body weight and minimum activity substantially reduced
- Variability of max activity increased – mostly due to sites reducing their limits while others maintained previous values
- 10/13 institutions modified administered activities according to the guidelines

Fahey, Ziniel, Manion, Treves. Submitted to JNM for publication

Stay Tuned for survey of 200 general hospitals!
85% knew of Image Gently, 60% knew of No Am Guidelines, 50% modified their practice based on No Am Guidelines!
Image Gently: The Horizon

- Head trauma Campaign: “Think AHEAD”
  - Multi organizational partnership: eg AAP, ACEP
  - Decision support/AC
  - Appropriate CT performance
- Website review
- Google Analytics
- Expanded international penetration
Image Gently: Challenges

- Resources against increased opportunities
- Measuring impact
- Staying on message
We should continue to improve the performance of medical imaging for children through educational efforts and partnerships. And we should continue to speak in an increasingly united and undistracted voice: CT is extremely valuable. Through these efforts, we can have the intended consequence of improving the imaging care of children.

Table 1  Image Gently initiatives in CT

<table>
<thead>
<tr>
<th>Initiative</th>
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<tbody>
<tr>
<td>Two CT meetings (CT vendor summit in 2008, IG ALARA in 2014)</td>
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<tr>
<td>Parent communication campaign in CT</td>
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<td>Pediatric accreditation through ACR</td>
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<td>Web-based Practice Quality Improvement Program in Pediatric CT</td>
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<tr>
<td>Parent information (multilingual)</td>
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<td>Eight web-based education modules for CT technologists</td>
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<td>International speakers’ bureau for requested talks on pediatric CT</td>
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<td>Cosponsor: American Association of Physicists in Medicine Task Group 204</td>
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<tr>
<td>Review of regulatory documents for CT in children</td>
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<td>Timely comments to scientific articles (letters to parents and editors)</td>
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<tr>
<td>and media</td>
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<tr>
<td>International outreach with International Atomic Energy Agency, World Health Organization and World Federation of Pediatric Imaging</td>
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<tr>
<td>Work with U.S. Food and Drug Administration, U.S. Environmental Protection Agency, National Quality Forum</td>
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<tr>
<td>Social media (website, newsletter, Twitter, Facebook)</td>
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<tr>
<td>Dental campaign, including cone beam CT</td>
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ACR American College of Radiology, ALARA as low as reasonably achievable, IG Image Gently
Image Gently: toward optimizing the practice of pediatric CT through resources and dialogue

Donald P. Frush · Marilyn J. Goske

“"We should continue to improve the performance of medical imaging for children through educational efforts and partnerships. And we should continue to speak in an increasingly united and undistracted voice: CT is extremely valuable. Through these efforts, we can have the intended consequence of improving the imaging care of children.""
Image Gently: Challenges

- Resources against increased opportunities
- Staying on message
- Measuring impact
Image Gently 2008
“Influences”

Choose Wisely?

Image Wisely Campaign 2010

EuroSafe Campaign 2014

AfroSafe Campaign 2015

Courtesy Kimberly Applgate
Contact Image Gently

- For more information, please visit the website: www.imagegently.org
- Questions or concerns, contact the Image Gently office at: imagegently@aol.com
- Like us on Facebook