The Image Gently Alliance: Year in Review - RSNA 2023

Donald P. Frush, MD
Chair, Image Gently Alliance

Courtesy George Bisset, MD

image gently®

Image Gently Alliance

- **2023 update**
- **Butterfly Award**
- **Image IntelliGently: AI in pediatric imaging. Marla Sammer, MD**
- **Open discussion for Alliance members**

Unique Considerations for Pediatric Imaging Compared with Adult Imaging Care: *Radiation Protection Relevance*

- *Different disorders*
- *Different clinical manifestations of similar disorders in adults*
- *Different imaging appearances for similar disorders*
- *Preverbal patients*
- *Requisite engagement with caregivers*
- *Need for child friendly environment*
- *Imaging team comfortable with and capable of pediatric care*
- *Increase dependence on sedation and anesthesia*
- *Familiarity with other immobilization strategies*
- *Large range of sizes*
- *Impact of morbidity and mortality and longer life expectancy*
- *Transfer of care: "age out"*
- *Variations in anatomy*
- *Variations in physiology*
- *Variable availability of pediatric referrers*
- *Majority of imaging (85%) in practices that are not pediatric centers (US)*
- *Potentially inadequate configurations for ionizing radiation equipment for children*
- *Potentially higher sense of significance with child morbidity and mortality*
- *Challenges with dose estimation*
- *Challenges with radiation sensitivity and risk estimations*

The need for stewardship:

making decisions FOR our youngest

In health or illness, children are our future

nature medicine

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nature > nature medicine > articles > article

Article | Open access | Published: 09 November 2023

Risk of hematological malignancies from CT radiation exposure in children, adolescents and young adults

Magda Bosch de Basea Gomez, Isabelle Thierry-Chef, Richard Harbron, Michael Hauptmann, Graham Byrnes, Maria-Odile Bernier, Lucian Le Cornet, Jérémie Dabin, Gilles Ferro, Tore S. Istad, Andreas Jahnen, Choonsik Lee, Carlo Maccia, Françoise Malchair, Hilde Olerud, Steven L. Simon, Jordi Figuerola, Anna Peiro, Hilde Engels, Christoffer Johansen, Maria Blettner, Magnus Kaijser, Kristina Kjaerheim, Amy Berrington de Gonzalez, ... Elisabeth Cardis + Show authors

Nature Medicine (2023) | Cite this article

6417 Accesses | **263** Altmetric | Metrics

Abstract

Over one million European children undergo computed tomography (CT) scans annually. Although moderate- to high-dose ionizing radiation exposure is an

November 2023: EPI-CT

"Results suggest that for every 10,000 children examined today (mean dose 8 mGy), 1–2 persons are expected to develop a hematological malignancy attributable to radiation exposure in the subsequent 12 years."

Press Release:

"A multinational study of almost one million individuals confirms a strong and clear association between exposure to radiation from CT scans in young people and an increased risk of blood cancers."

Alliance Update

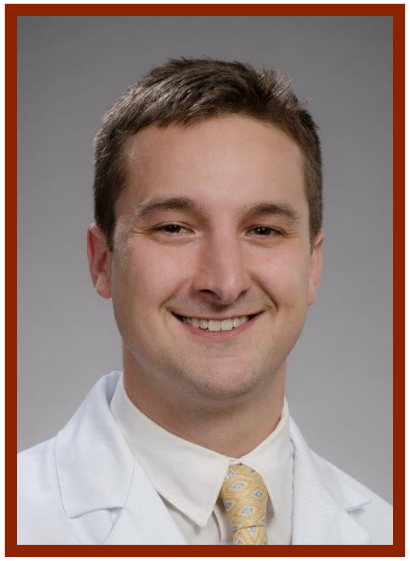
- Operations
- Partnerships
- Presentations
- Publications
- Projects

Alliance Update

- **Operations**
- **Partnerships**
- **Presentations**
- **Publications**
- **Projects**

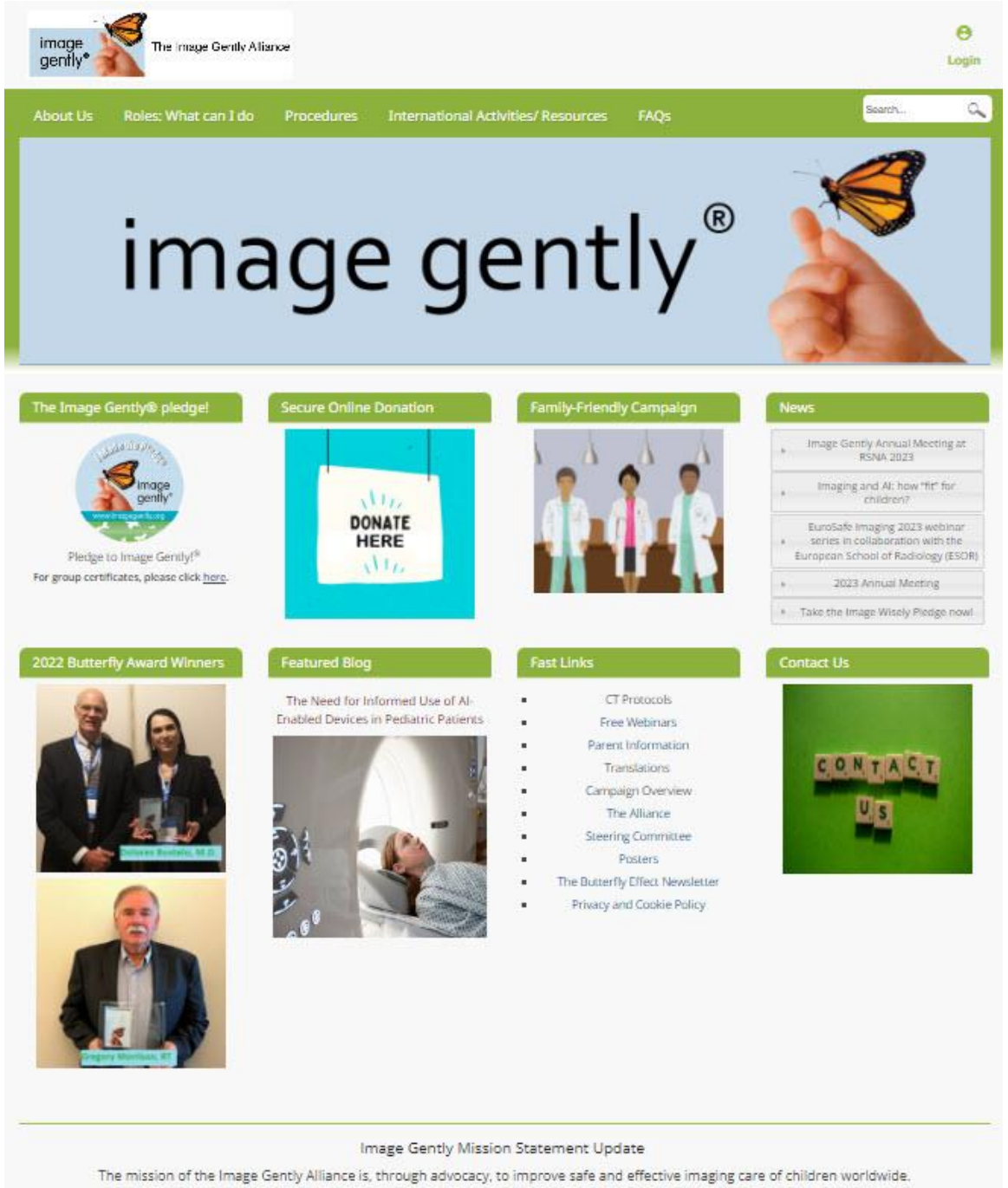
Committee Updates

- **Candy Stewart and Dara Ferguson**
- **New Members:**
  - **Craig St. George M.S.,R.T.(R)(VI)**
  - **Summer Kaplan, MD**
  - **Eric Monroe, MD**



Alliance Update: Operations

- **Website updated**
- **Revising email list**
- **Reviewing “pledge” model**


The Image Gently Alliance
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The Image Gently® pledge!
Pledge to Image Gently!®
For group certificates, please click here.
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Family-Friendly Campaign
News
Image Gently Annual Meeting at RSNA 2023
Imaging and AI: how "fit" for children?
EuroSafe Imaging 2023 webinar series in collaboration with the European School of Radiology (ESOR)
2023 Annual Meeting
Take the Image Wisely Pledge now!
2022 Butterfly Award Winners
Featured Blog
The Need for Informed Use of AI-Enabled Devices in Pediatric Patients
Fast Links
CT Protocols
Free Webinars
Parent Information
Translations
Campaign Overview
The Alliance
Steering Committee
Posters
The Butterfly Effect Newsletter
Privacy and Cookie Policy
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Image Gently Mission Statement Update
The mission of the Image Gently Alliance is, through advocacy, to improve safe and effective imaging care of children worldwide.


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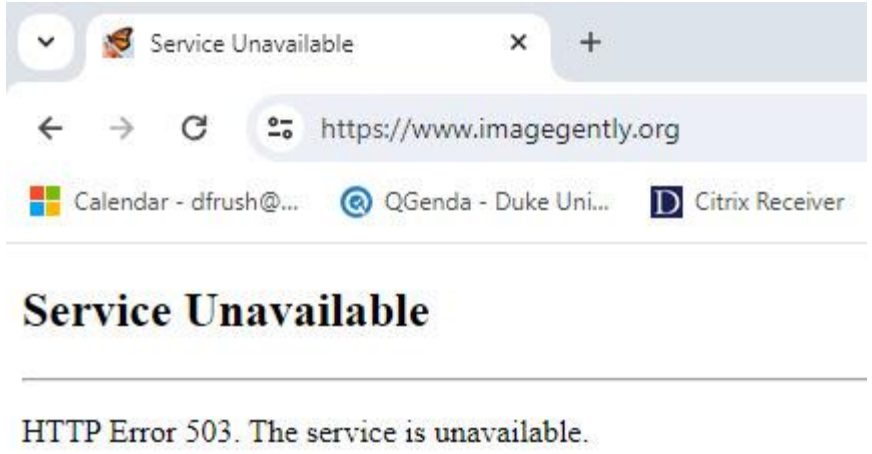
Alliance Update: Operations

This Past Friday www.imagegently.org



"The HyperText Transfer Protocol (HTTP) 503 Service Unavailable server error response code indicates that the server is not ready to handle the request. Common causes are a server that is down for maintenance or that is overloaded."

My initial search

Mathew 5:30:
"You're blessed when you are at the end of your rope…

Alliance Update

- Operations
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- Projects

Founding Societies

Society for Pediatric Radiology

American College of Radiology

American Society of Radiologic Technologists

American Association of Physicists in Medicine

Global Cooperation

QUALITY – SAFETY

ISR QSA

Arab Safe
Promoting Radiation Safety

AFROSAFE RAD
Championing Radiation Safety

Canada Safe Imaging | Imagerie Sécuritaire Canada

ESR EUROSAFE IMAGING

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IMAGE WISELY

LATIN SAFE

LATIN SAFE PEDIATRIA

image gently®

ASIASAFE

SLARP

IRRADIEMOS CONCIENCIA | Campaña de tomografía de baja dosis de radiación en niños

About the Campaign

Our **Let's Radiate Awareness** campaign aims to help, through 12 basic tips, to reduce the dose of ionizing radiation emitted when a computed tomography (CT) scan is performed on our Latin American children, thus generating awareness of the importance of knowing, learning and working safely with one of the most widely used diagnostic methods.

We know that diagnostic imaging is a tool that has become fundamentally important, facilitating the approach to various pathologies and their treatment. This, in turn, has brought with it a marked increase in exposure to ionizing radiation and CT is the main contributor to this burden. Ionizing radiation is potentially harmful and no unnecessary exposure should be allowed, which is why the **International Commission on Radiological Protection (ICRP)** created the principle of **ALARA (As Low As Reasonably Achievable)** which translates to: as ***low radiation as reasonably possible***, and is a precept that must be complied with and individualized in each pediatric patient.

Radiation dose is of particular concern in the pediatric patient. Children's cells, which divide rapidly, are more radiosensitive than those of adults. Children have a longer lifespan to manifest potential radiation injury and the potential for radiation-induced cancer expression later in life is the primary concern in pediatric patients.

This campaign aims to ensure that, by working together, we can optimise imaging for our paediatric patients with good quality CT scans and reduce the radiation dose.

Social Media Toolkit

Join the **Let's Radiate Awareness Campaign** by sharing the 12 educational tips on your social networks.

Download the materials in Spanish or Portuguese by clicking on the links below. Use the **#IrradiemosConciencia** to join the broadcast and tag SLARP in your posts. On Instagram find us as **@slarp.oficial**, Twitter **@SLARPok**

Download Parts Pack in Spanish

Download parts pack in Portuguese

https://slarp.net/irradiemos-conciencia/

Alliance Update

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2023 Image Gently Presentations

- European Congress of Radiology (ECR)
- Congresso Brasileiro De Radiologia (CBR)
- ACR Blue Ribbon Panel on Fluoroscopy Safety
- IAEA Consultancy Meeting February 2023
- IAEA Technical Meeting Feb-March 2023
- IAEA Technical Meeting (AFRA) December 2023
- Annual Meeting of the Radiogical Society of Saudi Arabia
- ICR Hurghada, Egypt March 2013
- AAPM Quality Measures Roundtable
- WHO Patient Safety Day
- West Virginia Society of Radiologic Technologists


A webinar organized for
World Patient Safety Day
17 September 2023
Engaging patients for medical radiation safety
18 September 2023
13:00-14:30 (CEST)
Click here for more information and to sign up for the event
ICRP
International Commission on Radiological Protection
International Organization for Medical Physics
IOMP
ISR
The International Society of Radiology
ISRRT
INTERNATIONAL SOCIETY OF RADIOGRAPHERS & RADIOLOGICAL TECHNOLOGISTS
RAD-AID INTERNATIONAL
WORLD FEDERATION OF NUCLEAR MEDICINE AND BIOLOGY
World Health Organization


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Alliance Update

- Steering Committee
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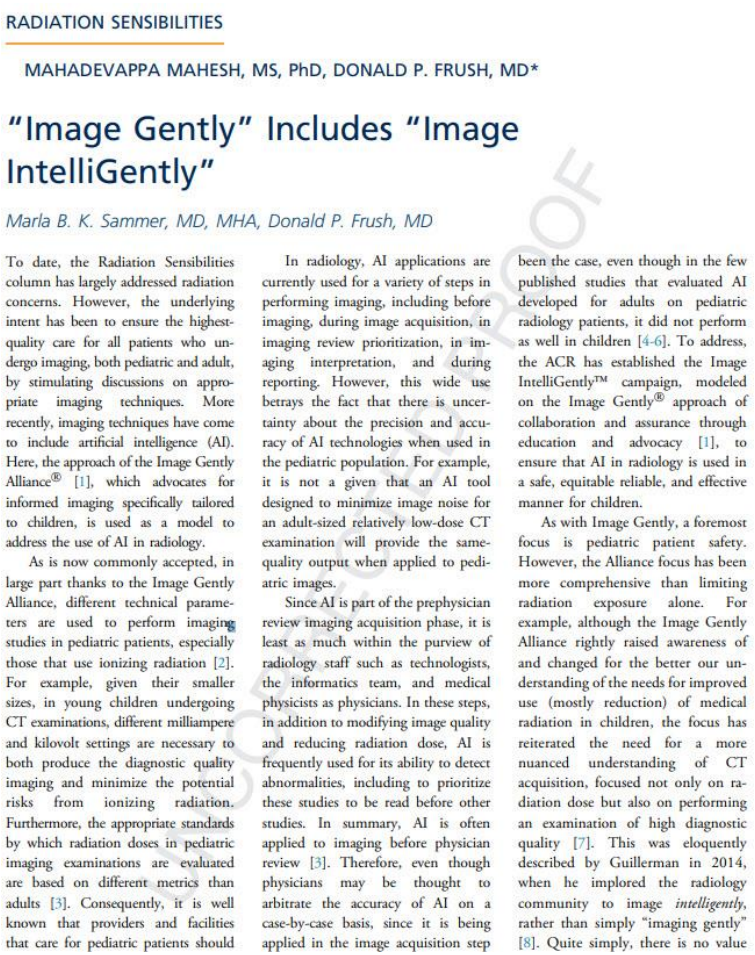

RADIATION SENSIBILITIES

MAHADEVAPPA MAHESH, MS, PhD, DONALD P. FRUSH, MD*

"Image Gently" Includes "Image IntelliGently"

Marla B. K. Sammer, MD, MHA, Donald P. Frush, MD

To date, the Radiation Sensibilities column has largely addressed radiation concerns. However, the underlying intent has been to ensure the highest-quality care for all patients who undergo imaging, both pediatric and adult, by stimulating discussions on appropriate imaging techniques. More recently, imaging techniques have come to include artificial intelligence (AI). Here, the approach of the Image Gently Alliance® [1], which advocates for informed imaging specifically tailored to children, is used as a model to address the use of AI in radiology.

As is now commonly accepted, in large part thanks to the Image Gently Alliance, different technical parameters are used to perform imaging studies in pediatric patients, especially those that use ionizing radiation [2]. For example, given their smaller sizes, in young children undergoing CT examinations, different milliampere and kilovolt settings are necessary to both produce the diagnostic quality imaging and minimize the potential risks from ionizing radiation. Furthermore, the appropriate standards by which radiation doses in pediatric imaging examinations are evaluated are based on different metrics than adults [3]. Consequently, it is well known that providers and facilities that care for pediatric patients should

In radiology, AI applications are currently used for a variety of steps in performing imaging, including before imaging, during image acquisition, in imaging review prioritization, in imaging interpretation, and during reporting. However, this wide use betrays the fact that there is uncertainty about the precision and accuracy of AI technologies when used in the pediatric population. For example, it is not a given that an AI tool designed to minimize image noise for an adult-sized relatively low-dose CT examination will provide the same-quality output when applied to pediatric images.

Since AI is part of the prephysician review imaging acquisition phase, it is least as much within the purview of radiology staff such as technologists, the informatics team, and medical physicists as physicians. In these steps, in addition to modifying image quality and reducing radiation dose, AI is frequently used for its ability to detect abnormalities, including to prioritize these studies to be read before other studies. In summary, AI is often applied to imaging before physician review [3]. Therefore, even though physicians may be thought to arbitrate the accuracy of AI on a case-by-case basis, since it is being applied in the image acquisition step

been the case, even though in the few published studies that evaluated AI developed for adults on pediatric radiology patients, it did not perform as well in children [4-6]. To address, the ACR has established the Image IntelliGently™ campaign, modeled on the Image Gently® approach of collaboration and assurance through education and advocacy [1], to ensure that AI in radiology is used in a safe, equitable reliable, and effective manner for children.

As with Image Gently, a foremost focus is pediatric patient safety. However, the Alliance focus has been more comprehensive than limiting radiation exposure alone. For example, although the Image Gently Alliance rightly raised awareness of and changed for the better our understanding of the needs for improved use (mostly reduction) of medical radiation in children, the focus has reiterated the need for a more nuanced understanding of CT acquisition, focused not only on radiation dose but also on performing an examination of high diagnostic quality [7]. This was eloquently described by Guillerman in 2014, when he implored the radiology community to image *intelligently*, rather than simply "imaging gently" [8]. Quite simply, there is no value

JACR Commentaries: "Radiation Sensibilities"

"Image Gently" Includes "Image IntelliGently" **M BK Sammer**
Journal of the American College of Radiology **Uncorrected Proof**
Published online: August 25, 2023

The International Commission on Radiological Protection: Working Toward Keeping Recommendations Fit for Purpose
Journal of the American College of Radiology **Vol. 20 Issue 7 p721–722**
Published online: March 28, 2023 KE Applegate

Has_Has Pediatric Digital Dental Radiography Kept Pace with Available Technology? **Keith J. Strauss[1], Aditya Tadinada[2], Usman Mahmood[3]**
In Press

Recurrent Medical Imaging Exposures for the Care of Patients: One Way Forward

Frush DP[1], Vassileva J[2], Brambilla M[3], Mahesh MM[4], Rehani M[5], Samei E[1], Applegate KE[6], Bourland JD[7], Ciraj-Bjenlac O[8], Dahlstrom D[9], Gershan V[2], Gilligan P[10], Godthelp BC[11], Hjemly H[12], Kainberger F[13], Mikhail-Lette M[8], Holmberg O[2], Paez D[8], Schrandt S[14], Valentin A[15], Van Deventer TE[16], Wakeford R[17]

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[3] Department of Medical Physics, University Hospital of Novara, Italy

[4] Department of Radiology, Johns Hopkins University School of Medicine, USA

[5] Department of Radiology, Massachusetts General Hospital, USA

[6] Department of Radiology, University of Kentucky, USA (retired)

[7] Department of Radiation Oncology, Wake Forest University School of Medicine, USA

[8] Division of Human Health, International Atomic Energy Agency, Vienna, Austria

[9] Communication Expert, Vienna, Austria

[10] European Federation of Organisations for Medical Physics, Mater Misericordiae University Hospital, Dublin, Ireland

[11] Authority for Nuclear Safety and Radiation Protection, The Hague, The Netherlands

[12] International Society of Radiographers and Radiological Technologists

[13] Department of Biomedical Imaging and Image-Guided Therapy, Medical University of Vienna, Austria

[14] ExPPect Champion, Patients for Patient Safety US (Affiliate, WHO PFPS Network), USA

[15] Department of Internal Medicine with Cardiology & Intensive Care Medicine Clinic Donaustadt Vienna Health Care Group, Vienna, Austria

[16] Radiation and Health Unit, World Health Organization, Geneva, Switzerland

[17] Centre for Occupational and Environmental Health, The University of Manchester, United Kingdom

Table 3: IAEA Consultancy Meeting Representation

American Association of Medical Physicists (AAPM)
American College of Radiology (ACR)
European Federation of Organizations for Medical Physics (EFOMP)
European Society of Radiology (ESR)
Heads of European Radiological Protection Competent Authorities (HERCA)
Image Gently Alliance
International Atomic Energy Agency (IAEA)
International Commission on Radiological Protection (ICRP)
International Organization for Medical Physicists (IOMP)
International Society of Radiology (ISR)
International Society of Radiographers and Radiological Technologists (ISRRT)
*World Health Organization (WHO)
In addition, physician representation from Austrian Society for Internal and General Intensive Care Medicine and a communication advisor
*including a WHO Patients for Patient Safety Network patient advocate

Recurrent Imaging and Cumulative Effective Dose (CED): Generating Dialogue

JOINT POSITION STATEMENT AND CALL FOR ACTION
FOR STRENGTHENING RADIATION PROTECTION OF PATIENTS UNDERGOING RECURRENT RADIOLOGICAL IMAGING PROCEDURES

This Position Statement was developed by the International Atomic Energy Agency (IAEA) jointly with the European Federation of Organizations for Medical Physics (EFOMP), European Society of Radiology (ESR), Global Diagnostic Imaging, Healthcare IT and Radiation Therapy Trade Association (DITTA), Heads of European Radiological Competent Authorities (HERCA), Image Gently Alliance, International Organization for Medical Physics (IOMP), International Society of Radiology (ISR), International Society of Radiographers and Radiological Technologists (ISRRT), in collaboration with the World Health Organization (WHO).

INTRODUCTION

Medical imaging is immensely beneficial in the diagnosis and management of many health conditions. Benefits of a given medical imaging procedure far outweigh inherent radiation risks when the procedure is both clinically indicated and correctly performed, using the minimum necessary radiation exposure to achieve the diagnostic or interventional objective. The Bonn Call for Action, jointly issued by the IAEA and WHO, emphasized the need for enhanced implementation in clinical practice of the principles of *justification and optimization*, the right procedure performed right, spotlighting radiation protection and safety for each patient exposure.

AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE

Proper Use of Radiation Dose Metric Tracking for Patients Undergoing Medical Imaging Exams

Frequently Asked Questions

Introduction
In August of 2021, the American Association of Physicists in Medicine (AAPM), the American College of Radiology (ACR), and the Health Physics Society (HPS) jointly released the following position statement advising against using information about a patient's previous cumulative dose information from medical imaging exams to decide the appropriateness of future imaging exams. This statement was also endorsed by the Radiological Society of North America (RSNA).

It is the position of the American Association of Physicists in Medicine (AAPM), the American College of Radiology (ACR), and the Health Physics Society (HPS) that the decision to perform a medical imaging exam should be based on clinical grounds, including the information available from prior imaging results, and not on the dose from prior imaging-related radiation exposures.

AAPM has long advised, as recommended by the International Commission on Radiological Protection (ICRP), that justification of potential patient benefit and subsequent optimization of medical imaging exposures are the most appropriate actions to take to protect patients from unnecessary medical exposures. This is consistent with the foundational principles of radiation protection in medicine, namely that patient radiation dose limits are inappropriate for medical imaging exposures. Therefore, the AAPM recommends against using dose values, including effective dose, from a patient's prior imaging exams for the purposes of medical decision making. Using quantities such as cumulative effective dose may, unintentionally or by institutional or regulatory policy, negatively impact medical decisions and patient care.

This position statement applies to the use of metrics to longitudinally track a patient's dose from medical radiation exposures and infer potential stochastic risk from them. It does not apply to the use of organ-specific doses for purposes of evaluating the onset of deterministic effects (e.g., absorbed dose to the eye lens or skin) or performing epidemiological research.

https://www.iaea.org/sites/default/files/position_statement_final_endorsed.pdf
https://www.aapm.org/org/policies/documents/EffectiveDose_FAQ.pdf

Contemporary issues in radiation protection in medical imaging: BJR Sept 2021
https://www.birpublications.org/toc/bjr/current

Recurrent Imaging and CED[1]

- General threshold discussed is ≥ 100 mSv
- Recent reports in adults vary:
  - "0.6–3.4%"
  - "Up to 1.9%"
  - "0.5%"
- Children:
  - "0-0.08%"
- In adults and children, oncology population most often
- In children, migration of imaging to MR and US
- "Bang for the buck"?

[1] *Br J Radiol* 2021; 94: 20210478

Alliance Update

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Image Gently Voice

- **Presence in ISR QSA**
- **Alliance review of ICRP Report TG 108 report: Optimisation of Radiological Protection in Digital Radiology Techniques for Medical Imaging**
- **AAOMR Shielding Recommendations** JADA 2023:154(9):826-835

Practice Guidelines

Patient shielding during dentomaxillofacial radiography

Recommendations from the American Academy of Oral and Maxillofacial Radiology

Erika Benavides, DDS, PhD; Avni Bhula, BDS, DDS, MSc; Anita Gohel, BDS, PhD; Alan G. Lurie, DDS, PhD; Sanjay M. Mallya, BDS, MDS, PhD; Aruna Ramesh, BDS, MS, DMD; Donald A. Tyndall, DDS, MSPH, PhD

ISR The International Society of Radiology

QUALITY ISR QSA SAFETY

ISRQSA Call for Action

G. Frija, D. Frush, Co-Chairs of the International Society of Radiology Quality and Safety Alliance (ISRQSA)

Background:

The following ISRQSA Call for Action is proposed to serve as a set of internationally relevant recommendations and guidelines for medical radiation safety, management, and informed use. In fulfilling its mission "...to facilitate the global endeavors of the ISR's member organizations to improve patient care and population health through medical imaging", the ISR and its Quality and Safety Alliance will function as both a primary actor as well as a facilitator through this Call for Action.

Action 1: Act in accordance for safe and effective imaging across all ages

Action 2: Identify medical imaging performance indicators including audit tools that can be attributable to improvements in patient care

Action 3: Develop an Imaging Stars network of imaging centers (or develop a program distinguishing imaging centers) that achieve the embodiment of best practice

Action 4: Establish a mutually beneficial engagement with national authorities

Action 5: Collaborate with stakeholders (e.g., radiographers, medical physicists, WHO and IAEA) with related initiatives

Action 6: Improve information for and communication with patients and caregivers for children about radiological procedures

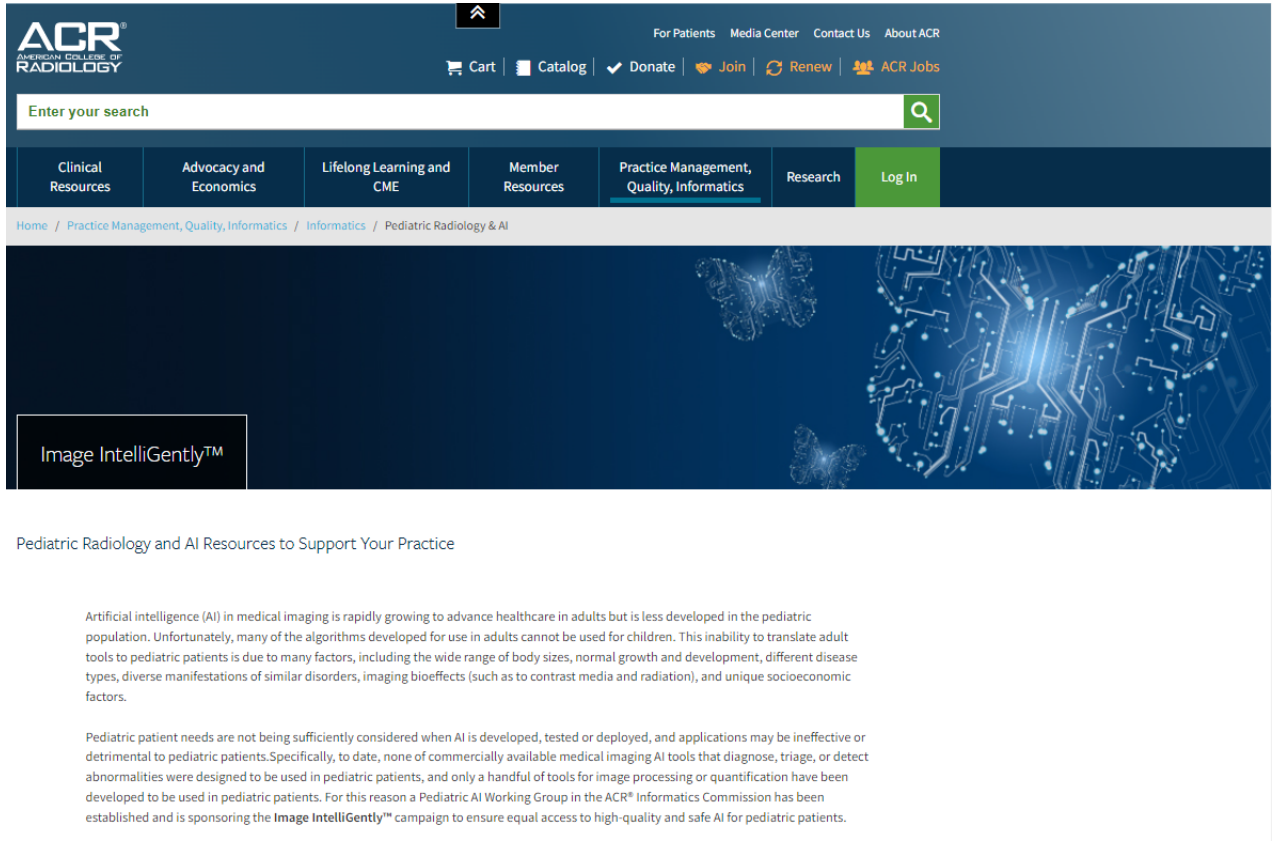
Action 7: Organize courses for health care professionals

Action 8: Develop clinical decision support system guidelines and implementation strategies

Action 9: Facilitate the establishment of a framework for what constitutes clinical diagnostic reference levels (DRLs) for adults and children

Action 10: Provide dose management models to establish these local and national DRLs

ACR Image IntelliGently



Pediatric AI

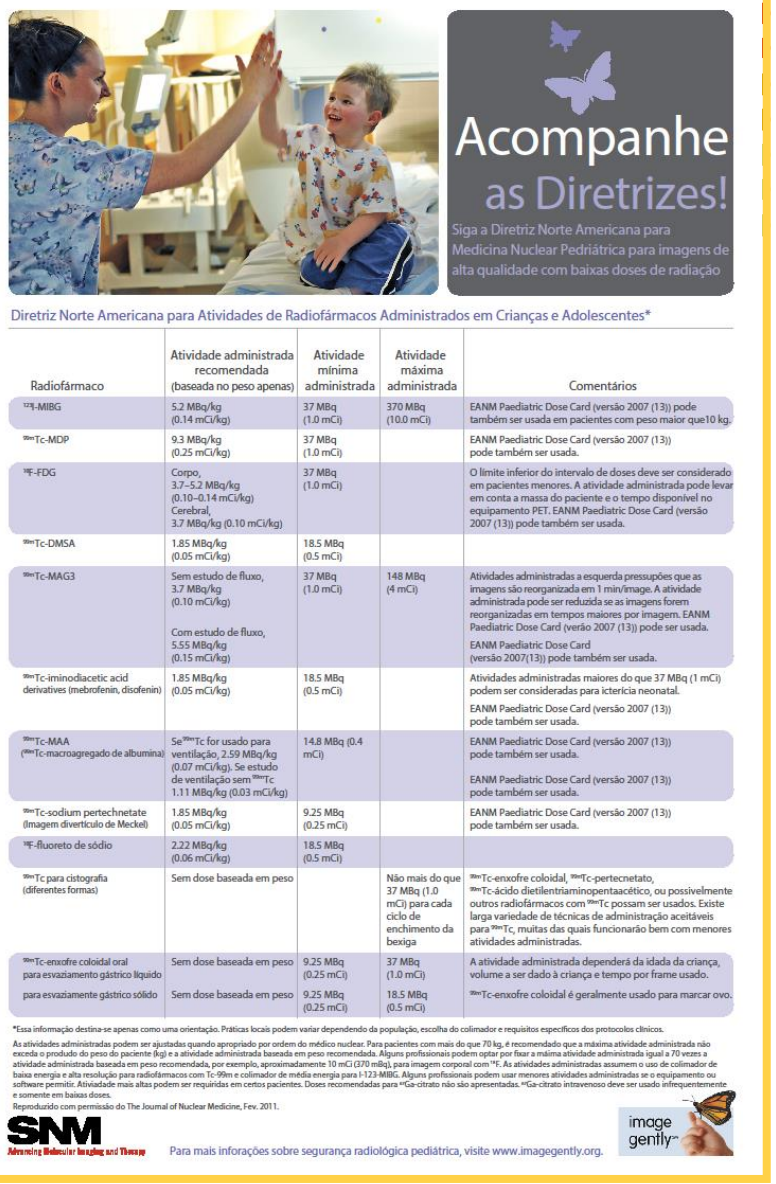
Marla Sammer, MD is lead

https://www.acr.org/Practice-Management-Quality-Informatics/Informatics/Pediatric-Radiology-AI-Resources

Poster Translations

SBMN

Sociedade Brasileira de Medicina Nuclear



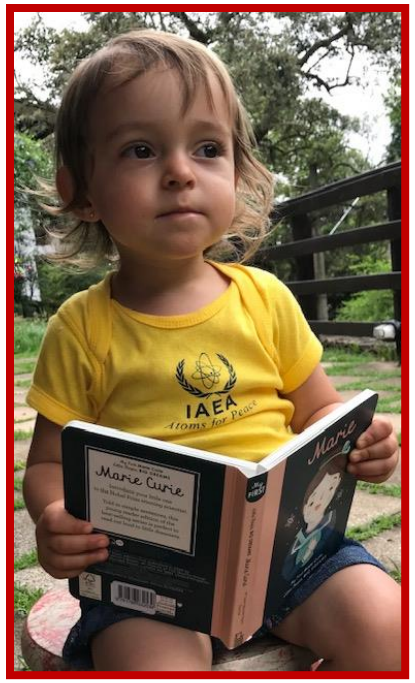
Transitioned to EFRS

ISRRT partnership in discussion

Family Friendly Campaign: Early Education

Radiology partnering with Family Medicine:

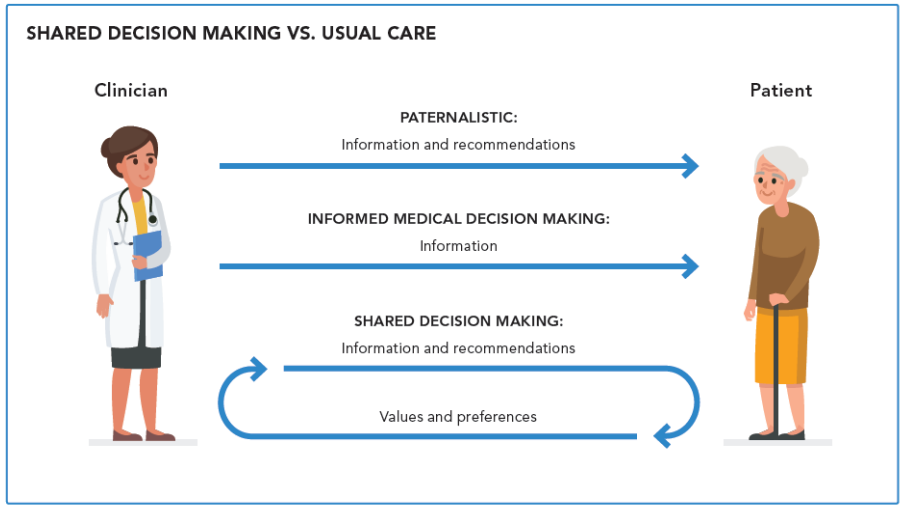
Alex Towbin and Chris Bunt: Leads



Ingrid, Courtesy of Paulo Costa

- Development of a module (four lessons) for medical school curricula:
  - medical radiation, radiation risk, decision support, informed dialogue, and shared decision making
- 60 minute course
- working with the ACR and the College's expertise and Learning Management System

With permission AHRQ



objectives

1. Explain radiation, radiation risks and risk mitigation strategies using layperson terminology
2. Utilize clinical decision support, or critically appraise the available literature, to guide medical recommendations
3. Describe how to engage with their healthcare teammates to utilize available evidence-based recommendations
4. Demonstrate shared decision-making with patients and their families

In health or illness, children are our future

Image Gently Alliance: 2023-4

Review/Submit

Radiation risk in medicine: Identifying and enabling patient-provider shared decision-making

Project Name & Contact Information	
Project Name	Radiation risk in medicine: Identifying and enabling patient-provider shared decision-making

1.

pcori PATIENT-CENTERED OUTCOMES RESEARCH INSTITUTE

Image Gently Alliance: 2023-4

Objectives:

1. Gain insights into patient perspectives through surveys and listening sessions,
2. involve clinicians and patients in identifying communication gaps, needs, and priorities, and
3. analyze collected data to identify common themes and patterns, to create a prioritized list of future communication and dissemination PCOR/CER questions.

pcori PATIENT-CENTERED OUTCOMES RESEARCH INSTITUTE

Image Gently Alliance

- 2023 update
- **Butterfly Award**
- Image IntelliGently: AI in pediatric imaging. Marla Sammer, MD
- Open discussion for Alliance members

2023 Butterfly Award
Congratulations!!

Jenia Vassileva

2023 Butterfly Award
Congratulations!!

Fred Mettler

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