Sociedad Argentina de Pediatría
Dirección de Congresos y Eventos
Comité Nacional de Diagnóstico por Imágenes

"Uso racional de Diagnóstico por Imágenes en Pediatría: ¿qué, cuándo y cómo lo pido?"

Jornadas Nacionales de Radiología Pediátrica
Agosto 2014

Sociedad Argentina de Pediatría
Dirección de Congresos y Eventos
Comité Nacional de Diagnóstico por Imágenes

"Radioprotección en Pediatría: ¿ qué debemos hacer ?"

Hospital Pedro de Elizalde

Dr Leopoldo Lonegro
Jefe División Radiodiagnóstico HGNPE
CABA - Argentina

Radioprotección

Es proteger al

individuo

a la población en general

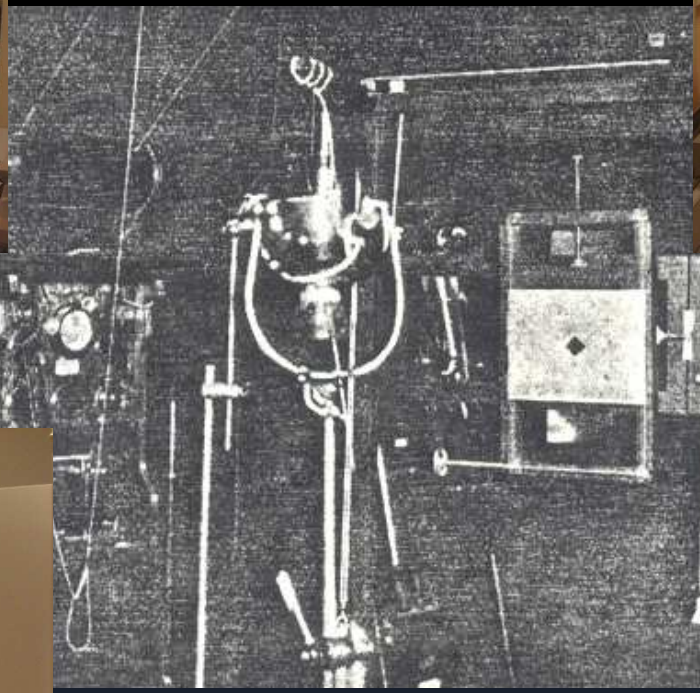
a su descendencia

de los riesgos de la utilización de equipos o materiales, que produzcan radiaciones ionizantes

Hospitales saludables

- Higiene hospitalaria
- Mantenimiento de las instalaciones
- Relevamiento del uso del mercurio en el hospital
- ***Radiaciones ionizantes***
- Manejo de residuos hospitalarios
- Capacitación e investigación
- Crear conciencia para el cuidado ambiental

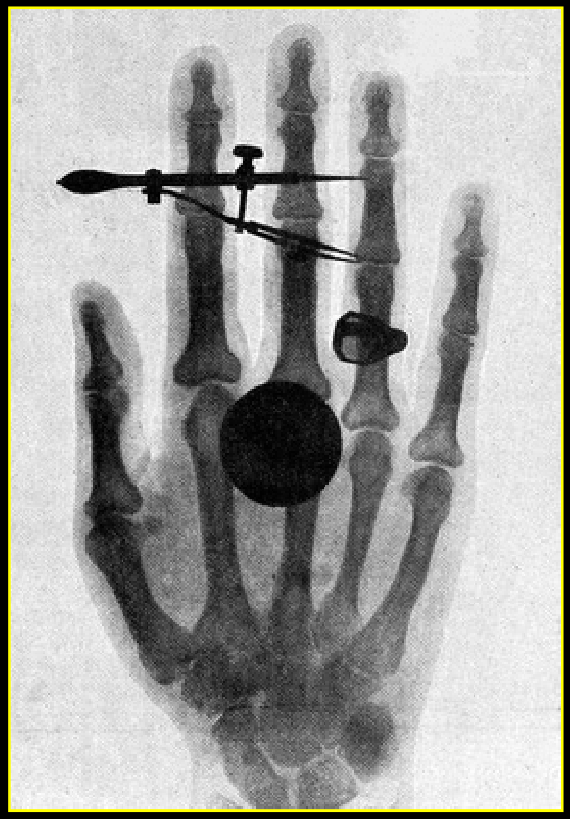
Radiología digital
US TC RMI
MN PET/TC
PET/MR



Background

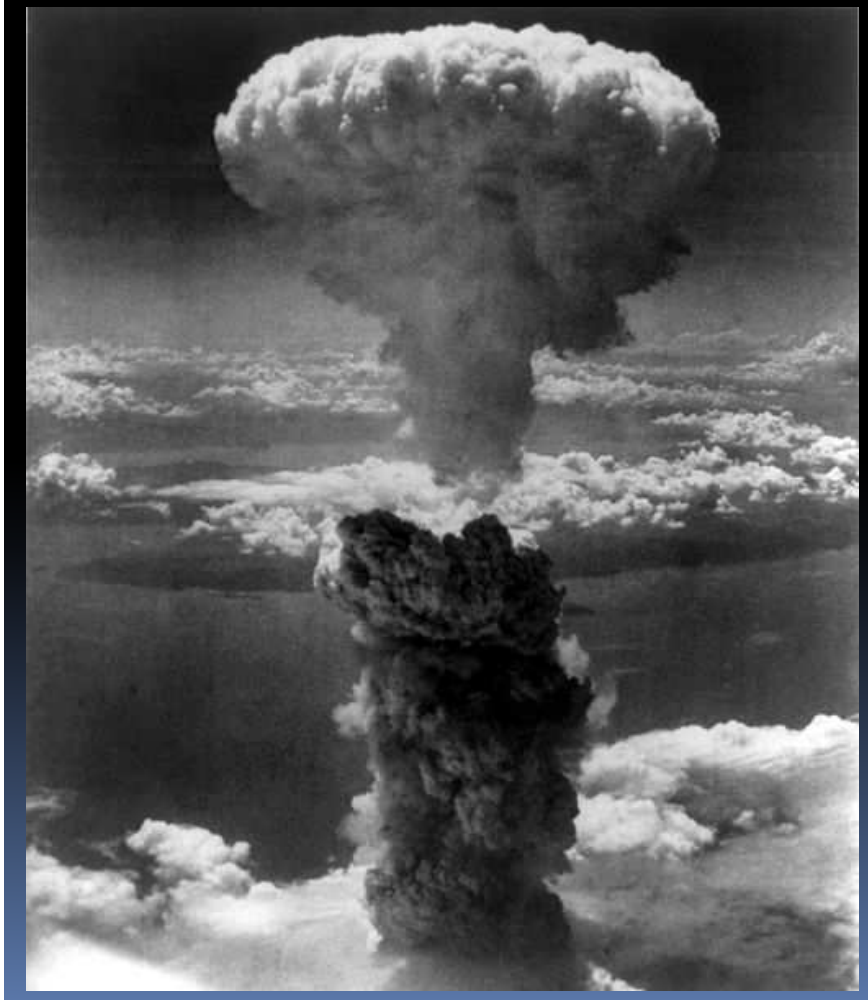
1895
Wilhelm
Roentgen

Anna Bertha
Roentgen



1896 - Henri Becquerel

1898 - Marie y Pierre Curie

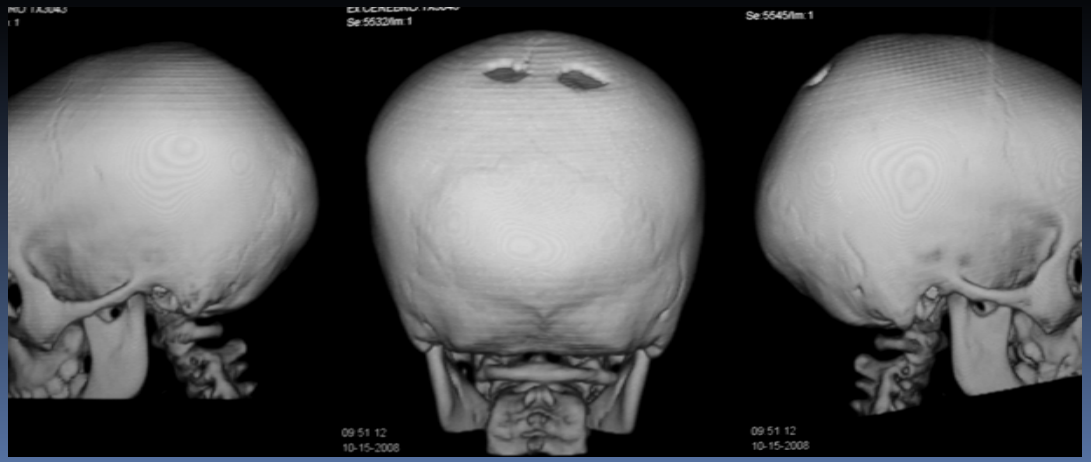


Hiroshima (350 mil habitantes)
En Nagasaki (270 mil habitantes)

¿Por qué preocupa la contaminación de los niños por radiaciones ionizantes?

Estudios de cohorte realizados a los sobrevivientes de Hiroshima y Nagasaki

Mayor incidencia de cáncer, en la población irradiada que ha recibido dosis entre 50 – 100 msv, pero también en los que recibieron menos de 50 msv



¿Por qué preocupa la contaminación de los niños por radiaciones ionizantes?

Dosis empleadas en radiodiagnóstico

Tendencia creciente en el número anual de:

prácticas, instalaciones y recurso humano

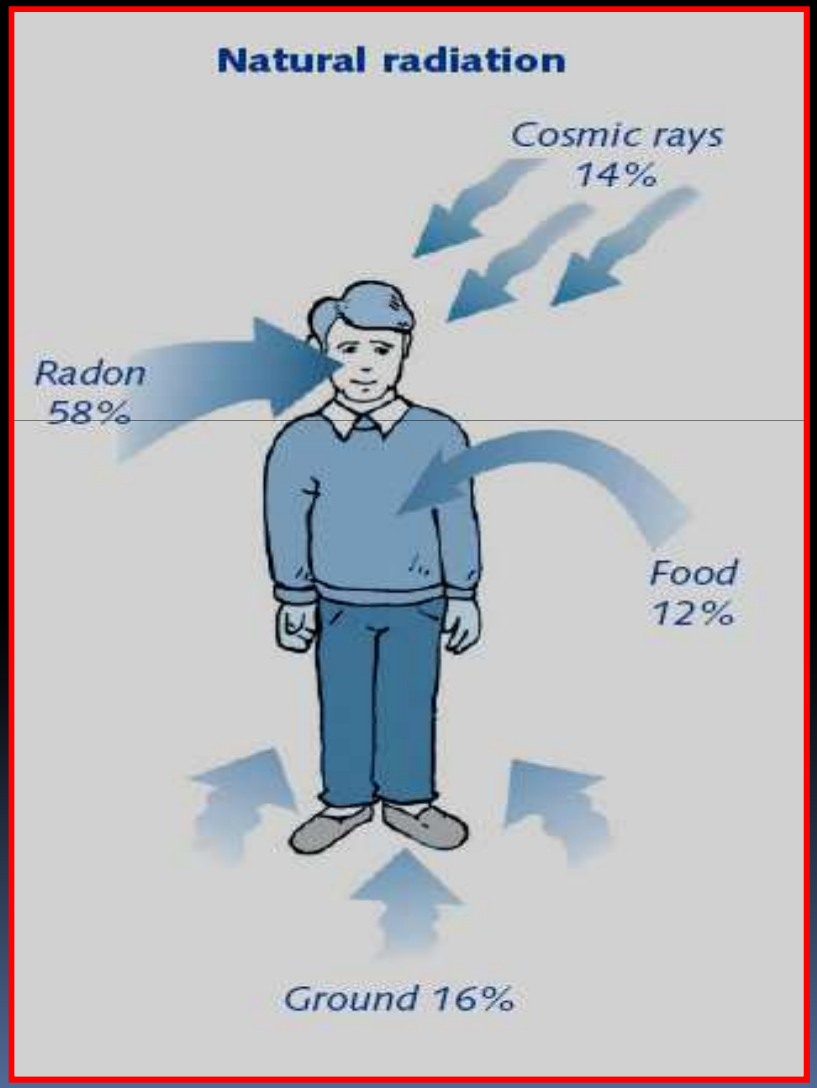
Surge la necesidad de proteger al grupo de casos especiales

Niños

Embarazadas

Familiares y acompañantes

Fuentes de radiacion



Media básica
3 mSv / año

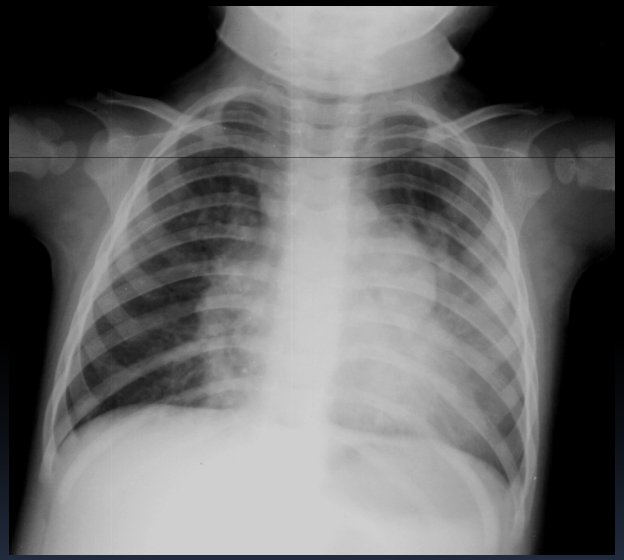
Todos estamos expuestos
a la radiación natural

http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1194947388410

FUENTES ARTIFICIALES

SUSTANCIAS RADIACTIVAS

EQUIPOS GENERADORES DE RX



Rx simple es la practica mas común

Uso de TC

¿Por qué debemos disminuir el uso de las prácticas con radiaciones ionizantes en pediatría?

La población está expuesta a los riesgos de la radiación natural

Con la radiación artificial que provocamos, no debemos aumentar la dosis de la radiación de fondo, excepto que la práctica esté justificada

Equivalencias de estudios en relación con la Rx de Tórax

Junta Nacional de Radioprotección, en Hospitales del Reino Unido 1990-1995

Procedimiento diagnóstico	Dosis efectiva característica (mSv)	Nº equivalente Rx de tórax	Periodo equivalente aproximado de rdiación natural de fondo
Rx extremidades	< 0.01	< 0.5	< 1.5 días
Tórax	0.02	1	3 días
Cráneo	0.07	3.5	11 días
Columna dorsal	0.7	35	4 meses
Columna lumbar	1.3	65	7 meses
Pelvis	0.7	35	4 meses
Abdomen	1.0	50	6 meses
Urografía i.v.	2.5	125	14 meses
Esofagograma	1.5	75	8 meses
EGDuodenal	3	150	16 meses
Enema opaco	7	350	3.2 años
TAC de craneo	2.3	115	1 año
TAC de tórax	8	400	3.6 años
TAC de abdomen	10	500	4.5 años

¿Cuánta radiación se utiliza en los exámenes de radiología pediátrica en comparación con otras exposiciones?

	Estimated dose	Days of background radiation
Natural background	3 mSv/year	1 day
Airline passenger	0.04 mSv	4 days
Chest X-ray	0.01 mSv	1 day
Head CT	2 mSv	8 months
Chest CT	3 mSv	12 months
Abdominal CT	5 mSv	20 months
Angiography or venography	11-33 mSv	4-11 years
CT guided intervention	11-17 mSv	4-6 years

www.imagegently.org

EL RIESGO POTENCIAL DE CÁNCER PARA UN NIÑO DE 5 AÑOS A PARTIR DE PROCEDIMIENTOS COMUNES

Examination	Effective dose (mSv)	Lifetime risk of fatal cancer
Limbs	<0.005	1/a few million
Chest (PA)	0.01	1/million
Spine (AP, PA, Lat)	0.07	1/150000
Pelvis	0.08	1/120000
AXR	0.10	1/100000
MCU	1.0	1/10000
CT Head	2	1/5000
CT Body	10	1/1000

Cook JV, Imaging, 13 (2001), Number 4

¿Por qué preocupa la contaminación de los niños por radiaciones ionizantes?

Aumento gradual del cáncer

Malformaciones congénitas

Los niños son más sensibles

- Los tejidos son más sensibles a las radiaciones que los adultos
- Están en un período continuo de cambios
- Son expuestos a las radiaciones ionizantes a edades muy tempranas

Responsabilidad del Pediatra

Estar **seguro** que el examen es necesario

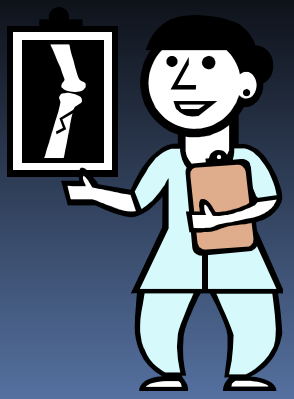
Usar la **modalidad** menos invasiva

Consultar al Radiólogo si no esta seguro

Conocer las dosis de radiación de las modalidades

No indicar practicas **por presión** de los padres o legal

Considerar **informar** a los padres

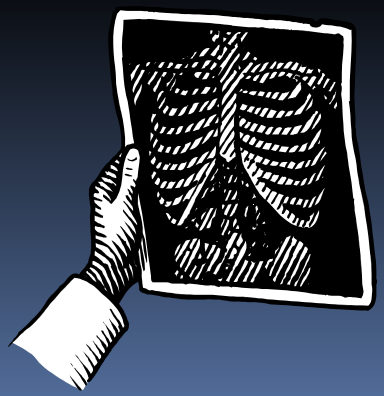


Responsabilidad del Radiólogo Infantil

Que **entiendan** las dosis de radiación

Requerimientos para altas dosis de estudios: escoger factores tecnicos apropiados PROTOCOLOS

Sumar esfuerzos: dialogo con pediatra y técnico



Responsabilidad del Técnico Radiólogo

Hospital Elizalde

Responsable inmediato de la protección del paciente, de si mismo, de otros profesionales y del público en general

PROTECCION AL ACOMPAÑANTE
PROTECCION EN UNIDADES CERRADAS

Optimización: ALARA

Principios de protección radiológica

Justificación de las prácticas

Beneficio

Limites de dosis

Es aplicable al personal ocupacionalmente expuesto a radiaciones y al público en general

Optimización de la practica

Manteniendo la exposición tan bajo como sea razonablemente posible

“ALARA” As Low As Reasonably Achievable

Principios de protección radiológica

Existe una práctica sistemática de exploraciones radiológicas inadecuadas

Genera necesidad de mejoras en la justificación de las exposiciones médicas

Se requiere de **soluciones efectivas** para garantizar que la justificación de la practica se realice con responsabilidad

Justificación de las prácticas

Beneficio

NO repetir exámenes ya realizados
NO solicitar exámenes que no alteran a la atención del paciente
NO pedir estudios con demasiada frecuencia
Estimular la consulta con el Radiólogo si hay dudas
Mejorar la información al Radiólogo y evitar el uso de técnicas inadecuadas

Desde 2001

2007 SPR y ACR: beneficios y riesgos

Editorials

Thomas L. Slovis, MD

The ALARA Concept in Pediatric CT: Myth or Reality?[1]

Editor's Note: In view of the importance of the topic, we are publishing in Radiology *this editorial highlighting the full publication "ALARA Conference Proceedings. The ALARA Concept in Pediatric CT—Intelligent Dose Reduction," which appears in the April 2002 issue of* Pediatric Radiology, *with agreement of the Editors.*
Anthony V. Proto, MD, Editor

The availability and intellectual acceptance of information does not always translate into appropriate action. This is particularly true regarding computed tomographic (CT) radiation dose in children because: *(a)* We have a difficult time understanding the statistical evaluation of material collected over 50-plus years; *(b)* few radiologists are conversant with the literature of the radiobiologist, physicist, and epidemiologist (including the publications of the Food and Drug Administration, or FDA, International Commission of Radiation Protection, and National Council on Radiation Protection), who collect, evaluate, and publish this evidence; *(c)* there have been no easy alternatives instantly available to begin to decrease radiation exposure without compromising diagnostic image quality (1–5); and *(d)* lack of understanding about the radiation dose in CT image quality (the uncoupling effect). For example, in conventional radiography, when the radiation dose was too high, we obtained a dark or black image and therefore adjusted technique (milliamperes and/or kilovolts). With digital technology, the image is uncoupled from the dose, and even when we use too much technique, we get a good image (4).

The manufacturers sell their CT scanners on the basis of the "best picture," albeit the highest-quality picture gives the greatest radiation dose. The incentive for industry to change must come from their customer base—the radiologist.

The Society for Pediatric Radiology, with an unrestricted grant from GE Medical Systems, organized a multidisciplinary conference to discuss dose issues in pediatric CT (As Low as Reasonably Achievable, or ALARA, Concept in Pediatric CT—Intelligent Dose Reduction) in August 2001. There were over 100 attendees (participants and registrants) from the crucial disciplines (scientists, physicians, technologists, manufacturers, and representatives of government agencies) necessary to respond to the problem(s).

The transcription of this unique conference is published in its entirety in the April 2002 issue of *Pediatric Radiology (link.springer.de/link/service/journals/00247/).* Since many children undergo imaging examinations by non-pediatric radiologists, a brief summary is presented as follows:

1. CT is a major diagnostic tool in children, and when performed for appropriate indications with proper technical parameters, the benefits far exceed the very small individual risk.
2. Children are more sensitive to radiation than are middle-aged adults by a factor of 10 (6,7). Girls are more sensitive than boys (6,7).
3. There is an excess cancer incidence in individuals who were exposed to radiation doses comparable with the dose involved in helical CT.
   a) There is in individuals a very small but statistically significant excess of cancer mortality over their lifetime (1,2).
   b) This excess cancer mortality is a public health issue that occurs when one multiplies a large number of CT examinations in children by a small risk (2).
   c) The incidence figures will be greater than (perhaps double) the mortality figures, but these data are not yet fully available (8).
4. There is no consensus regarding a single expression of dose. Effective dose, organ dose, background equivalent radiation time, and CT dose index, among others, were discussed.
5. Research for improving the description of dose should continue, but a substantial number of participants thought the currently calculated effective dose was a good starting point. An international or national regulatory group may be necessary to determine what information should be displayed on every manufacturer's CT scanners.
6. It is important to reduce radiation dose but still maintain acceptable (diagnostic) image quality. Some of the suggestions to accomplish this were:
   a) Perform examinations only for appropriate indications.
   b) Use published weight-related parameters for CT in children.
   c) Manufacturers need to be more user-friendly and provide the tools to prevent excess doses, such as automatic milliamperes by patient weight, modulating milliamperes, and dose caps. We must move away from a fixed milliamperes protocol.
   d) More research on dose reduction by reduction of kilovolts and maintenance of diagnostic image quality.

Index terms:
Computed tomography (CT), in infants and children
Computed tomography (CT), radiation exposure

Published online before print
10.1148/radiol.2231012100
Radiology 2002; 223:5–6

[1] From the Department of Pediatric Imaging, Children's Hospital of Michigan, 3901 Beaubien Blvd, Detroit, MI 48201-2196. Received January 4, 2002; revision requested January 7; revision received and accepted January 7. Address correspondence to the author (e-mail: tslovis@med.wayne.edu).

476 ANNOUNCEMENTS AND BOOK REVIEWS September 1960

token of high esteem, and in recognition of noted professional attainments by Leo G. Rigler, distinguished graduate of the University of Minnesota, highly respected former chief of the Department of Radiology at Minnesota, inspiring teacher, devoted scientist and author, progressive leader in the development of x-ray diagnosis in chest diseases, esteemed spokesman for internationally known radiological societies, deem him to be worthy of special commendation for outstanding achievement conferred on June tenth, nineteen hundred and sixty."

DR. GLASSER HONORED

Dr. Otto Glasser, Cleveland, Ohio, was recently awarded the Commander's Cross of the Order of Merit of the Federal Republic of Germany, in recognition of his work on the life of W. C. Röntgen, and his contributions to radiology. Dr. Glasser is also holder of the Röntgen-Honor-Plaque and Honorary Curator of the Röntgen-Museum in Remscheid-Lennep.

CHILDREN'S MEMORIAL HOSPITAL FELLOWSHIP

A Fellowship in Pediatric Roentgenology will be offered, beginning Jan. 1, 1961, by the Department of Radiology of the Children's Memorial Hospital, Chicago, to residents who have successfully completed at least two, and preferably three, years of training in radiology. Further details may be obtained from Dr. Harvey White, Chief, Department of Radiology, The Children's Memorial Hospital, 707 Fullerton Ave., Chicago 14, Ill.

Letter to the Editor

IMAGE INTENSIFIER RISK

To the Editor of Radiology

DEAR DR. DODD:

I have been rather perturbed, when examining diagnostic units fitted for use with the electronic image intensifiers (image amplifiers), to observe the lack of attention paid to an obvious radiation hazard.

the head and shoulders of the viewer by providing the usual type of viewing screen with lead glass backing as a surrounding shield to the image intensifier; they do not thereby remove the hazard to the patient nor to the hands of the radiologist. Further, the screen provided is of little use for viewing by the person using the image intensifier.

Because the field visualised is rather small, the most likely method of use is to open the rectangular beam-defining aperture until the intensifier is fully illuminated. The edges of the diaphragms are then lost from view and the x-ray beam therefore could illuminate a much larger area of the patient than is seen; also, the hands of the person manipulating the patient could enter the x-ray beam without being observed.

It is not sufficient to fit stops as an answer to this problem, so that the edges of the field become tangential to the circle seen through the intensifier, since the corners of such a field are still not visualised and may cause damage. It is usually possible, however, to fit a subsidiary circular diaphragm of just sufficient size to cover the screen of the intensifier, so interlocked that the screening circuits operate only when the diaphragm is in place.

When this has been done, the problem of alignment becomes evident. It is necessary that this should be routinely checked by the radiographer in charge of the machine, and some means whereby this alignment can be simply adjusted by the radiographer must be provided by the manufacturer.

F. W. TRANTER
Christie Hospital and Holt Radium Institute
Manchester, England

Books Received

Books received are acknowledged under this heading, and such notice may be regarded as recognition of the courtesy of the sender. Reviews will be published in the interest of our readers and as space permits.

INTRA-OSSEOUS VENOGRAPHY. By ROBERT A. SCHNEIDER, M.D., Clinical Instructor in Surgery, Albert Einstein College of Medicine, New York, N. Y.; Section Chief, Surgical Service, Veterans Administration Hospital, Bronx, N. Y.; Formerly Associate, Cancer Research Surgeon, Roswell Fore- ne of Grune Price

ASNR Response to Lancet Article

June 20, 2012

A recently published study in The Lancet (Radiation exposure from CT scans in childhood and subsequent risk of leukaemia and brain tumours: a retrospective cohort study, Mark S Pearce et al., The Lancet 07 June 2012) reports that cumulative radiation exposure from multiple computed tomography scans during childhood could increase the risk of developing cancer as an adult. The American Society of Neuroradiology urges parents to weigh the risks and benefits of CT exams that are recommended for their children. It is important to realize that current radiation doses are much lower than those reported in the Lancet study, which was conducted 1985 to 2002. Physicians are well aware of the potential harm caused by radiation, and order CT scans when the value of a rapid, accurate diagnosis exceeds the risk. For this reason, the risks of CT scanning usually are very small compared to the benefits. If a parent is concerned about the risk of a CT scan, he or she should discuss this with their pediatrician, a radiologist or a medical physicist. We encourage parents to visit the following websites that address concerns raised from the Lancet article and learn more about radiation exposure associated with pediatric CT scanning.

ImageGently.org
RadiologyInfo.org
ACR.org

The Lancet, Early Online Publication, 7 June 2012
doi:10.1016/S0140-6736(12)60815-0 Cite or Link Using DOI
This article can be found in the following collections: Oncology (Cancer epidemiology & prevention & control, Paediatric cancer); Paediatrics (Paediatric cancer

Radiation exposure from CT scans in childhood and subsequent risk of leukaemia and brain tumours: a retrospective cohort study

Dr Mark S Pearce PhD a, Jane A Salotti PhD a, Mark P Little PhD c, Kieran McHugh FRCR d, Choonsik Lee PhD e, Kwang Pyo Kim PhD e, Nicola L Howe MSc a, Cecile M Ronckers PhD c f, Preetha Rajaraman PhD c, Alan W Craft MD b, Louise Parker PhD g, Amy Berrington de González DPhil a

Summary

Background

Although CT scans are very useful clinically, potential cancer risks exist from associated ionising radiation, in particular for children who are more radiosensitive than adults. We aimed to assess the excess risk of leukaemia and brain tumours after CT scans in a cohort of children and young adults.

Perspectives

Radiology

Robert T. Bramson, MD
George A. Taylor, MD

SOS: Can We Save Pediatric Radiology

In November 1972, John Holt wrote an editorial in *American Journal of Roentgenology, Radium Therapy, and Nuclear Medicine* (1) in which he said there were too many pediatric radiologists in practice, there were too many radiology residents entering pediatric fellowship training, and radiology at that time had a crop of pediatric radiologists that was too young to make it a wise career choice for large numbers of radiology residents. What a difference a generation makes!

Try to hire a pediatric radiologist. They are in short supply. One hundred one positions for pediatric radiologists went unfilled in 2003, and by the end of 2004 the number had reached 117 (S. Royal, Society of Pediatric Radiology Committee on Physician Workforce 2004, personal communication, January 2005). That number represents about 15% of the total number of pediatric radiologists who practice in North America. For the past 5 years, the number of new pediatric radiologists that annually enter the working pool has fluctuated between 20 and 35 (S. Royal, Society of Pediatric Radiology Report of Membership Committee, personal communication, January 2005). At that rate, it will take 3–5 years just to fill the available positions if no one retires. The mean age of pediatric radiologists is the oldest of the radiology subspecialists—by 10 years in some cases (2). Retirement looms closer for a large percentage of pediatric radiologists with each passing year.

On the basis of our own experience and what we have learned from others, the number of applicants for pediatric radiology fellowship positions either remains stable or, in recent years, has had several periods of decline. No new fellowship training programs are being added, and many existing programs risk losing their accreditation because they have had no trainees in several years. In addition, an increasing percentage of pediatric radiologists are women. The percentage of women who work part time is greater than the percentage of men who work part time, resulting in fewer "full-time equivalents" in the active workforce (2,3).

Most radiology groups, including our own, have seen an annual workload increase of about 4%–6%. Academic institutions, where the majority of pediatric radiologists practice, also report that the workload for their radiologists continues to increase annually by about 5%–6%. Pediatric hospitals report a similar steady increase in radiology workload, as measured in relative value units (4,5).

At the same time, many third-party payers are contracting with companies that manage radiology benefits and costs to health plans. According to one of these companies, National Imaging Associates, "about one third of advanced imaging tests are either inappropriate for the medical problem or don't contribute to a doctor's diagnosis or a patient's outcome" (6). These efforts in controlling medical imaging costs have resulted in complex requirements for preauthorization and the diversion of more expensive imaging examinations, such as computed tomography (CT) and magnetic resonance (MR) imaging, away from academic or specialty centers toward less expensive providers. That, however, does not always reduce work demands for pediatric radiologists, although it may decrease costs to the third-party payer. For example, at our pedia
interpret or provide a
CT or MR images ob
institution approxim
each year. The studie
other locations either
payers referred them t
program like National
ates, or because a pe
was not available at t
tain and interpret the
trends reinforce the co
sence of pediatric rad
point out how an ov
pediatric radiologists w
work with little or no
sation because of the
tem. We will say mo
inequities later in this

Great! Rejoice! Fewe
work means more mo
ing supply of radiolog
place does not work
Apple Computer cont
marketplace with its M
comprehensive description of these di
verse activities or accurate prediction of
which projects will be undertaken by in
dividual pediatric radiology researchers is
almost an impossible task. What may be
more constructive is a review of the types
of research and research strategies that we
in pediatric radiology must address, with
an emphasis on what is unique to chil
dren. Several abstracts presented at the
1997 meeting of the Society for Pediatric

Published online
10.1148/radiol.2353050142
Radiology 2005; 235:719–722

[1] From the Department of Radiology, Children's Hospital-Boston and Harvard Medical School, 300 Longwood Ave, Boston, MA 02115. Received January 28, 2005; accepted February 2. Address correspondence to R.T.B. (e-mail: robert.bramson@childrens.harvard.edu).

Future Directions of Imaging Research: Subspecialty Society Messages

Charles A. Gooding, MD
Lane F. Donnelly, MD
Diego Jaramillo, MD

Society for Pediatric Radiology

Pediatric Radiology Research: Anticipating the Millennium[1]

It is truly an exciting time in pediatric imaging research. As we approach the new millennium, there are so many facets of radiology research that need to be explored. Because pediatric radiology represents all anatomic subspecialty areas and modalities, the research opportunities are diverse, ranging, for example, from clinical descriptions of new interventional procedures to basic scientific research in contrast agents for magnetic resonance (MR) imaging and ultrasonography (US). A comprehensive description of these diverse activities or accurate prediction of which projects will be undertaken by individual pediatric radiology researchers is almost an impossible task. What may be more constructive is a review of the types of research and research strategies that we in pediatric radiology must address, with an emphasis on what is unique to children. Several abstracts presented at the 1997 meeting of the Society for Pediatric Radiology (SPR) will be used as illustrative examples.

There are several issues unique to pediatric radiology research. First, most children are healthy, and populations of children with specific diseases are often small, such as children with malignant or genetic diseases. Because of the small return per investment dollar, private industry often does not have the financial motivation to fund research projects for small pediatric patient populations, as compared with large patient populations such as adult patients with breast cancer or coronary artery disease. It also may be difficult to generate a large enough group of patients at a single institution to render statistically significant results. Another issue unique to children is that the features that allow differentiation between normal and diseased organs continuously change with age (1,2) and the manifestations of disease may differ markedly even within the subgroups of children, for example, neonates compared with adolescents. Also, structures are smaller and motion is faster in children than in adults (1); these factors make the performance of some imaging techniques challenging and in need of special adaptation for use in children. Other difficulties encountered in pediatric research include the need for sedation of the child and its associated risks, the concern about radiation effects, and the inability of minors to grant informed consent.

In addition to the unique factors of pediatric research, there are also many issues that make research in radiology unique as compared with that in other scientific disciplines. Radiology is the only medical discipline that is defined by the imaging approach to a medical problem, rather than an organ system or disease process (3). This premise has historically restricted what has been considered appropriate research territories in radiology. In addition, much of the research in radiology has been viewed as being mostly descriptive and has been slow to develop its own financial base (2,4–6). There has been a historical tendency of cost shifting from clinical revenue to cover research expenses, rather than the pursuit of external research funding (6,7). This is a particular problem for children's hospitals, which tend to have a lower profit margin than many adult hospitals and, therefore, have less funds to "shift." Academic radiology has also suffered from a lack of basic research training and a perception in some radiology departments that clinical work is more important than research effort (6,7).

It must be the goal of the pediatric imaging researcher to overcome these issues. If research is going to prosper in pediatric radiology, the first goal we must address is securing adequate resources and the personnel needed to produce quality pediatric imaging research. Research plans can be developed both at the national level and at specific institutions. Pediatric radiology must encourage and sponsor young, bright researchers. The SPR, as well as multiple other radiology societies, offers a number of seed grants aimed at promoting quality research. Radiology societies play other vital roles in developing young researchers. Involvement of young researchers in national societies and maintenance of contacts with peers and colleagues at other institutions correlate with increased research productivity (8). Radiology teaching programs must also emphasize research training during residency and fellowship to create the pediatric imaging researchers of tomorrow (6). Pediatric radiologists must also support the quality of our journals, not only by contributing quality articles but also by contributing time and expertise to the

Index terms:
Editorials
Radiography, in infants and children
Radiology and radiologists, research

Radiology 1998; 206:579–581

[1] From the Department of Radiology, University of California San Francisco, M-372, 505 Parnassus Ave, San Francisco, CA 94143-0628 (C.A.G.); the Department of Radiology, Duke University Medical Center, Durham, NC (L.F.D.); and the Department of Radiology, Children's Hospital, Boston, Mass (D.J.). Received October 15, 1997; accepted November 24. Address reprint requests to C.A.G.

See also the article by Kirks (pp 382–383) in this issue.

RIESGO DE RADIACIÓN EN RADIOLOGÍA PEDIÁTRICA

Public Health Risk The main issue from a public health perspective is the "*potential problem that accumulates when a risk that is acceptable to the individual is multiplied by the 2.7 million procedures performed each year in children*"

2007 EEUU 24000 scanners o equipos de TC

68,7 milones de estudios

niños corresponde el 11% de los estudios

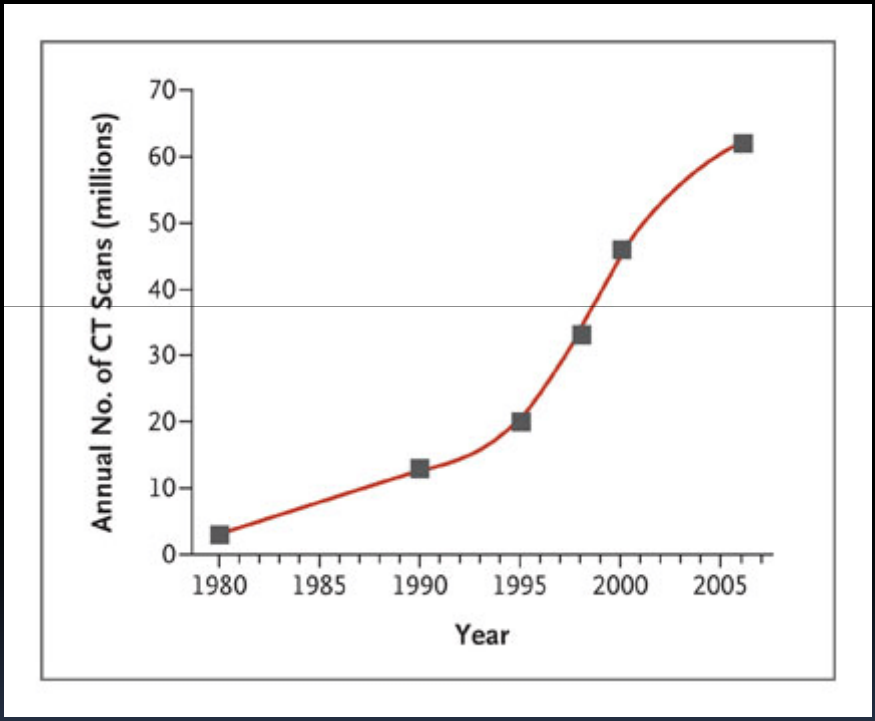
Dra Ines Boechat

Professor of Radiology and Pediatrics- Geffen School of Medicine at UCLA

Hall EJ, Lessons we have learned from our children: cancer risks from diagnostic radiology, Pediatr radiol (2002) 32: 700-706

The NEW ENGLAND JOURNAL of MEDICINE

Computed Tomography — An Increasing Source of Radiation Exposure
David J. Brenner, Ph.D., D.Sc., and Eric J. Hall, D.Phil., D.Sc.



Brenner and Hall 357 (22): 2277, November 29, 2007
Estimated Number of CT Scans Performed Annually in the United States
The most recent estimate of 62 million CT scans in 2006

¿Cuanto interés tiene la gente?

Optimización: TC 3 mill de entradas en google
Image Gently 45 mill

This article can be found in the following collections: Oncology (Cancer epidemiology & prevention & control, Paediatric cancer);Paediatrics (Paediatric cancer

Radiation exposure from CT scans in childhood and subsequent risk of leukaemia and brain tumours: a retrospective cohort study

Dr Mark S Pearce PhD [a], Jane A Salotti PhD [a], Mark P Little PhD [c], Kieran McHugh FRCR [d], Choonsik Lee PhD [c], Kwang Pyo Kim PhD [e], Nicola J Howe MSc [a], Cecile M

ASNR Response to Lancet Article
June 20, 2012

¿Cuanto interés tiene la gente?

- AM de EEUU: artículos que advierten sobre riesgos de radiación con el uso de TC
- 2% de 1,4 millones de CA se relacionan con TC
- Información masiva sobre ser mas conciente con el uso de Rx
- NCI Instituto Nacional del Cáncer de EEUU y el Instituto de Salud de la Universidad de Newcastle, Inglaterra advierten del riesgo según estudio de 175.000 niños seguidos entre 1985 y 2002 desde el nacimiento hasta los 22 años estudiados con una o mas TC. El riesgo de tumores cerebrales y de leucemia se multiplico por 3.
-

Respuesta de la SPR y ACR

Educacion

Elección de practicas

Concepto ALARA

Conferencias y documentos

The Alliance for Radiation Safety in Pediatric Imaging

Objetivo

Alianza para la seguridad radiológica en la imagen pediátrica

Integrada por:

- American College of Radiology (ACR)
- Society for Pediatric Radiology (SPR)
- Sociedad Europea de Radiología Pediátrica (ESPR)
- Sociedad Latino Americana de Radiología Pediátrica (SLARP)

Concientizar a los profesionales, en reducir las dosis de los estudios radiológicos en los niños

www.imagegently.org

Pause and Pulse - Safety in Pediatric Fluoroscopic Imaging

www.imagegently.org

WFP | The World Federation of Pediatric Imaging

Conclusiones

Protección radiológica

Equipamiento y técnicas

Medioambiente

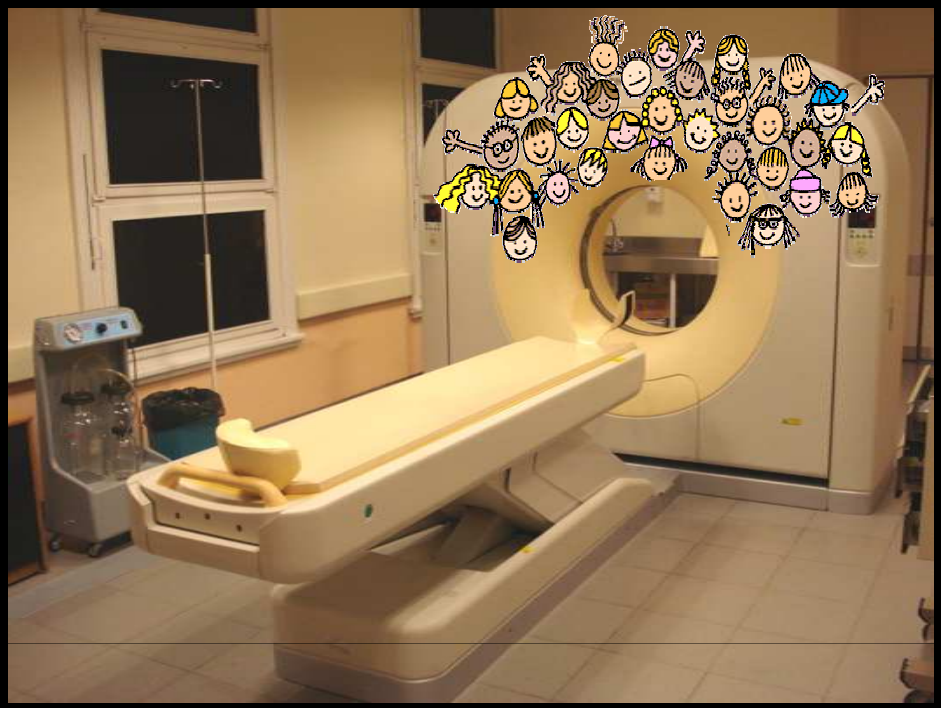
Educación

Unidad Pediátrica Ambientalista Hospital Pedro de Elizalde

+

Servicio de Imágenes

Conclusiones



Racionalización de Estudios Radiológicos

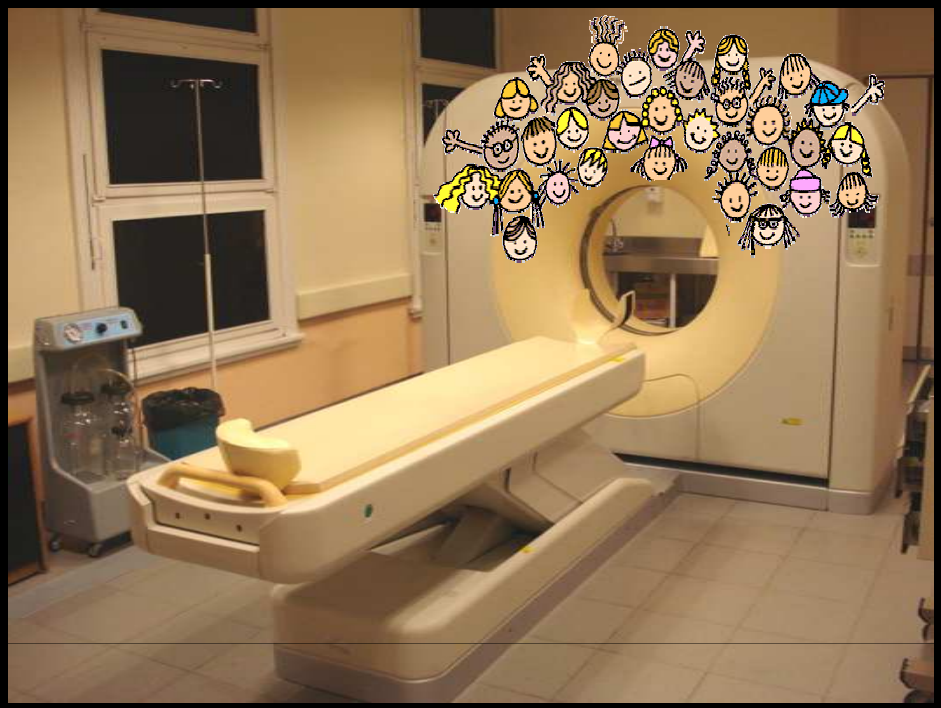
Estimular uso de US, RMI

Ajustar parámetros de exposición (TC)

Promover técnicas (colimación y mA bajo)

Cumplir principios de Radioprotección: Justificación y Optimización

Conclusiones

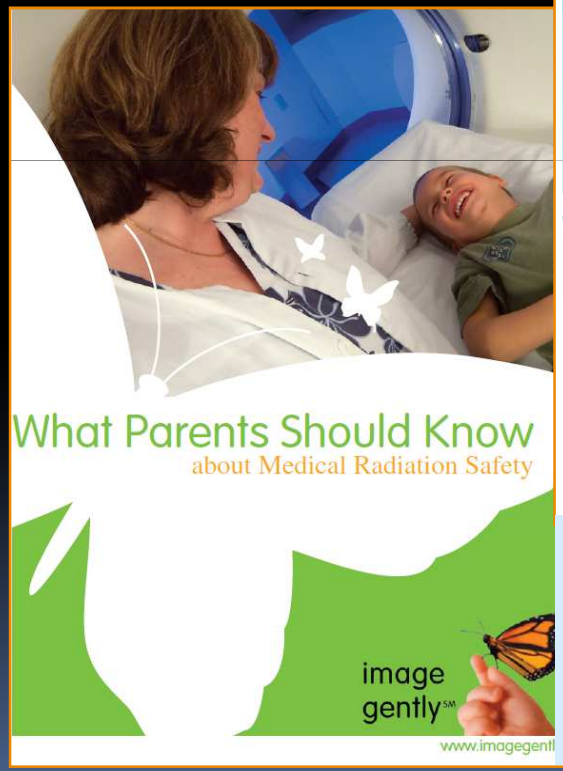


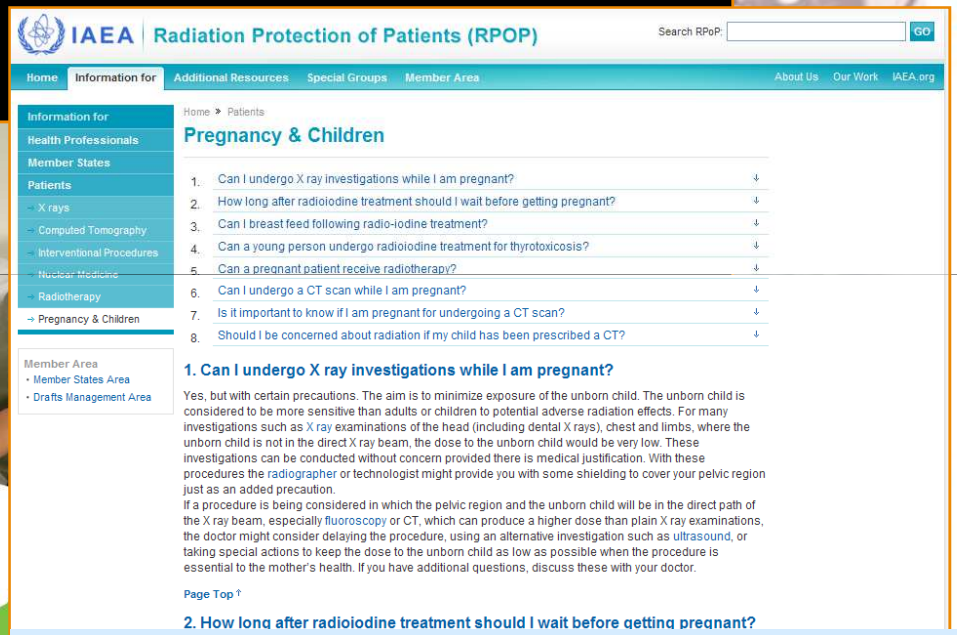
Informar a la población

Registro individual de exposiciones: Tarjeta Infantil de Exposiciones a Radiaciones Ionizantes

Educación

Información para los padres en Servicio de Diagnostico por Imágenes Pediátrico





El tiempo empleado en explicar a un niño y sus padres lo que va a ocurrir está justificado, pues ello ayudara a cumplir con los criterios de calidad necesarios

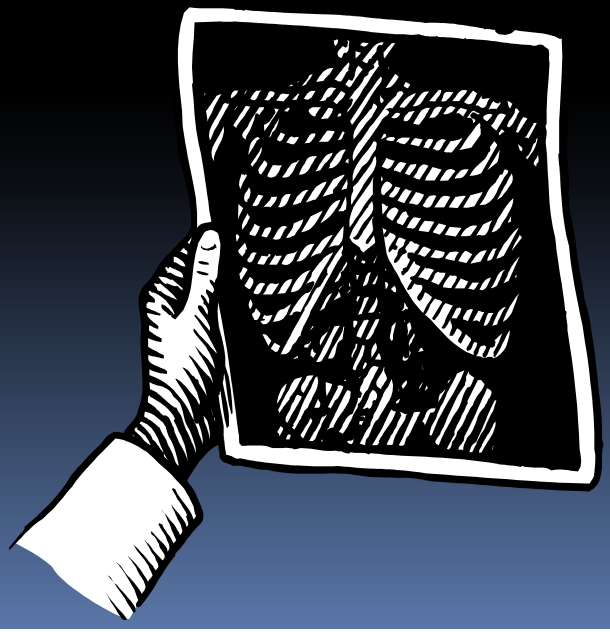
¿El Pediatra puede contribuir a la protección radiológica?

No solicitar

estudios innecesarios

de Rx y TC

Situaciones en las que debería considerar reducir el número de proyecciones radiográficas



Rx de huesos largos

La necesidad de la extremidad opuesta debe ser evaluada por el radiólogo y se utiliza sólo una visión limitada

Rx de tórax perfil

¿es necesario de rutina?

Situaciones en las que debería considerar reducir el número de proyecciones radiográficas

Radioscopia

no debe ser usada en reemplazo de los exámenes radiográficos convencionales

Seguimiento radiológico de pacientes

El número de proyecciones debe limitarse a resultados anteriores

SI EL EXAMEN ESTA JUSTIFICADO
EL BENEFICIO SIEMPRE ES POSITIVO

La preocupación por la protección del paciente pediátrico no debe comprometer nunca la calidad ni la eficacia de un

examen radiológico

Un examen incompleto o mal realizado

también es radiación inútil

Gracias...

Hospital Pedro de Elizalde

Los estudios ¿son hechos por especialistas pediatricos?

¿Existen guías o recomendaciones?