A HEALTHIER WORLD THROUGH BOLD INNOVATION

Science, Radiation Protection and the NCRP: Building on the Past, Looking to the Future

Eleventh Annual Warren K. Sinclair Keynote Address

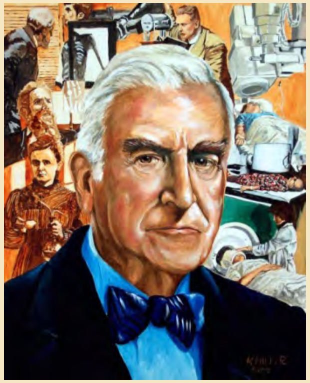
Jerrold Bushberg Ph.D., DABMP, FAAPM
Clinical Professor Radiology & Radiation Oncology
Senior Vice-President NCRP

Dr. Warren Sinclair

- **An Extraordinary Scientist, Teacher and Administrator**
- **Invaluable scientific contributions**
  Radiation Biology & Protection
  during a career of more than four decades
- **Positions Held**
  - ✓ Medical physicist -Royal Cancer Hospital & lecturer U of London
  - ✓ 1954 Head Physics Department--M.D. Anderson Hospital
  - ✓ 1960 --Argonne National Laboratory--Director of the Division of Biological and Medical Research & Associate Laboratory Director for Biomedical and Environmental Research
  - ✓ **1977 Follows Dr. Taylor as 2nd President of NCRP (1977 – 1991)**

  - ✓ **Other Notable Appointments**
    -Chairman of ICRP Committee I
    -Member U.S. delegation at UNSCEAR
    -Taylor lecturer in 1997

Dr. Warren Sinclair's 1997 Taylor Lecture



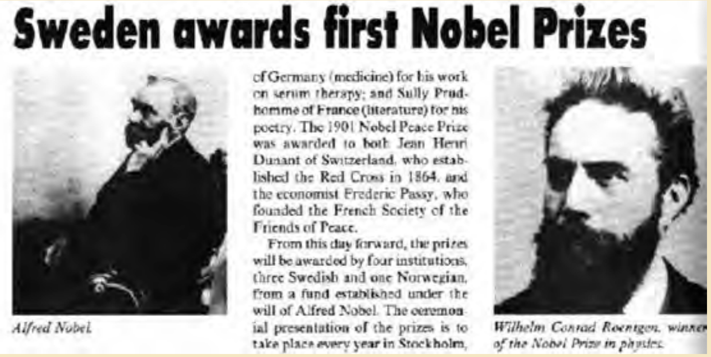
Dr. Michael Fry's Introduction of Dr. Sinclair-
the 1997 Taylor Lecturer Commenting on Dr. Sinclair's
strongly held and any even more strongly defended
scientific opinions

"I often wondered whether, Warren, you knew the old Scottish-Irish prayer…"

"Lord, grant that I may always be right, for Thou knowest I am hard to turn."

Why Was the NCRP and Similar Organizations Created?

Historical Context



Sweden awards first Nobel Prizes

of Germany (medicine) for his work on serum therapy; and Sully Prudhomme of France (literature) for his poetry. The 1901 Nobel Peace Prize was awarded to both Jean Henri Dunant of Switzerland, who established the Red Cross in 1864, and the economist Frederic Passy, who founded the French Society of the Friends of Peace.

From this day forward, the prizes will be awarded by four institutions, three Swedish and one Norwegian, from a fund established under the will of Alfred Nobel. The ceremonial presentation of the prizes is to take place every year in Stockholm,

Alfred Nobel

Wilhelm Conrad Roentgen, winner of the Nobel Prize in physics

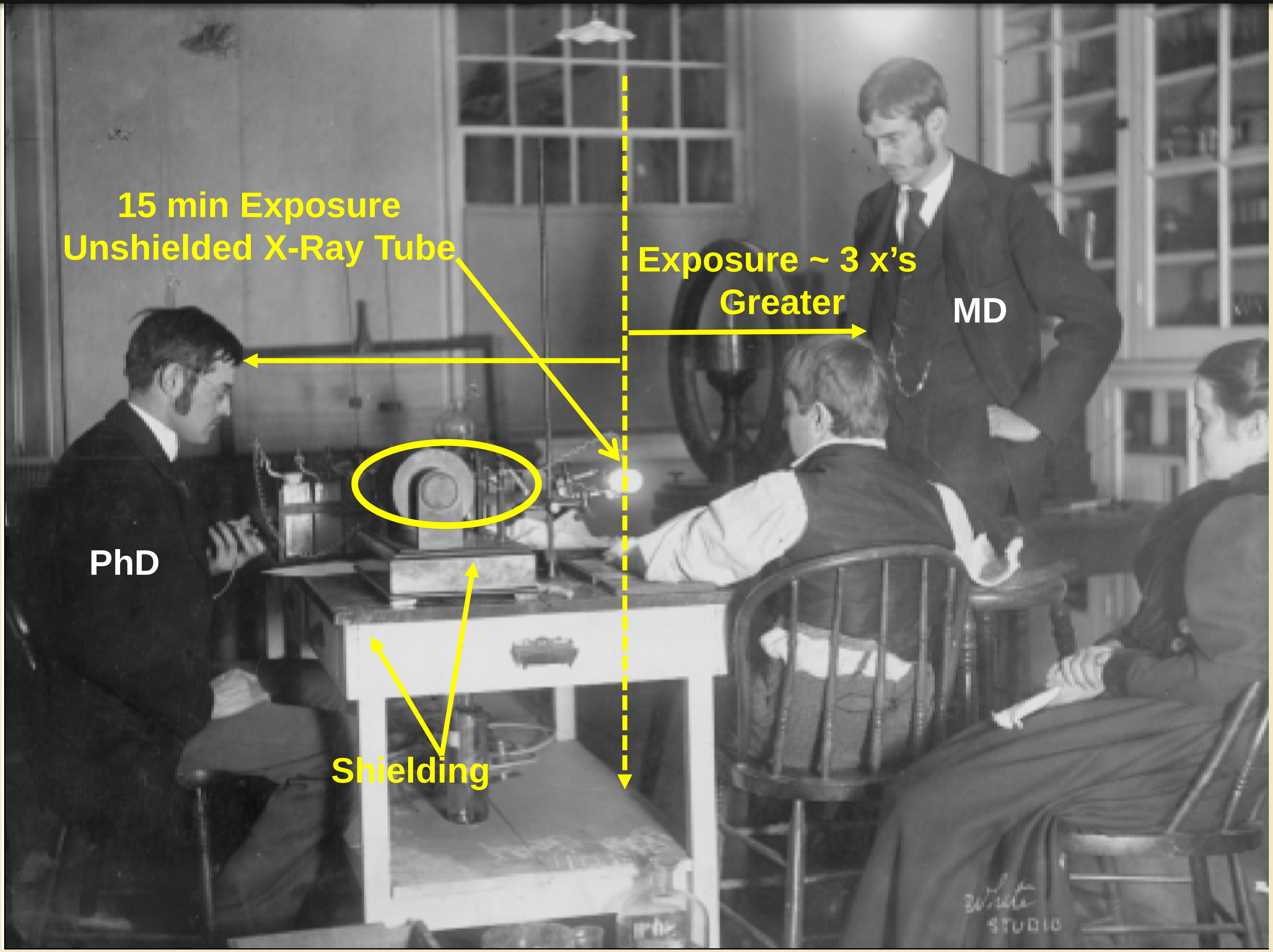
- **Discovery of Ionizing Radiation**
  - Discovery of X rays: Roentgen (1895) 1st Nobel Prize (1901)
  - Discovery of Radioactivity: Becquerel (1896)

- **First Reports on Harmful Effects**
  - Radiation-induced alopecia and skin burn (1896)
  - Radiation-induced skin cancer (1902)
  - Clarence Dally, Thomas Edison's assistant died in 1903 following several skin grafts and amputations. He was 39 years old. Edison abandoned his research on X-rays.
  - Many other acute and chronic effects of radiation were reported over the decades

- **No Standard Procedures for Measuring Radiation Exposure --Few Safety Precautions --Not Well Known**

Before Radiation Protection

Drs. Edwin and Gilman Frost: Brothers- Physicist and Physician perform the First American Medical X-ray in Reed Hall, Dartmouth College on 2/3/1896



The Radiation Craze of the Early 1900's

Radiation Once Had a Positive Public Image

- Many Commercial Products were developed and sold to the public.

- Radium emanation activators, apparatuses that would "apply radium emanation to water overnight", started being produced and marketed in the early 1900"s

Advertisement: "Fill jar every night. Drink freely . . . when thirsty and upon arising and retiring, average six or more glasses daily."

- 1916: The AMA Comes to the Rescue—but not the way you think

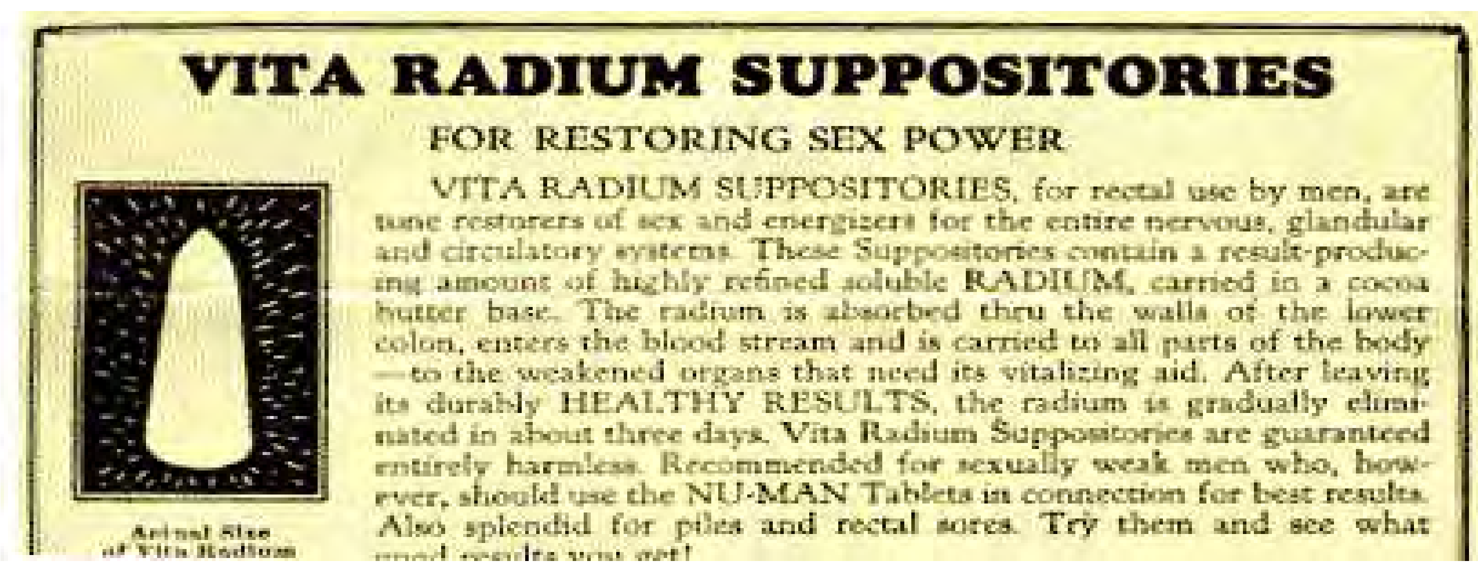
Abuse of these discoveries by pseudoscientists and hucksters lead to unnecessary (and often harmful) uses of radiation sources which were guaranteed by their purveyors to cure everything from lethargy to erectile dysfunction.

Vita Radium Suppositories (ca.1930)
"For Restoring Sex Power"

From the Company's Brochure:

"Weak Discourage Men!
Now Bubble Over With Joyous Vitality
Through the Use of Vita Radium Suppositories
15 day Course Guaranteed to Contain Real
Refined Radium & to be Perfectly Harmless
…properly functioning glands make themselves known in a quick, brisk step, mental alertness and the ability to live and love in the fullest sense of the word….A man must be in a bad way indeed to sit back and be satisfied without the pleasures that are his birthright!......
Try them to see what good results you get."

All Home Products customer orders will be shipped in a plain paper wrapper



VITA RADIUM SUPPOSITORIES

FOR RESTORING SEX POWER

VITA RADIUM SUPPOSITORIES, for rectal use by men, are tune restorers of sex and energizers for the entire nervous, glandular and circulatory systems. These Suppositories contain a result-producing amount of highly refined soluble RADIUM, carried in a cocoa butter base. The radium is absorbed thru the walls of the lower colon, enters the blood stream and is carried to all parts of the body —to the weakened organs that need its vitalizing aid. After leaving its durably HEALTHY RESULTS, the radium is gradually eliminated in about three days. Vita Radium Suppositories are guaranteed entirely harmless. Recommended for sexually weak men who, however, should use the NU-MAN Tablets in connection for best results. Also splendid for piles and rectal sores. Try them and see what good results you get!

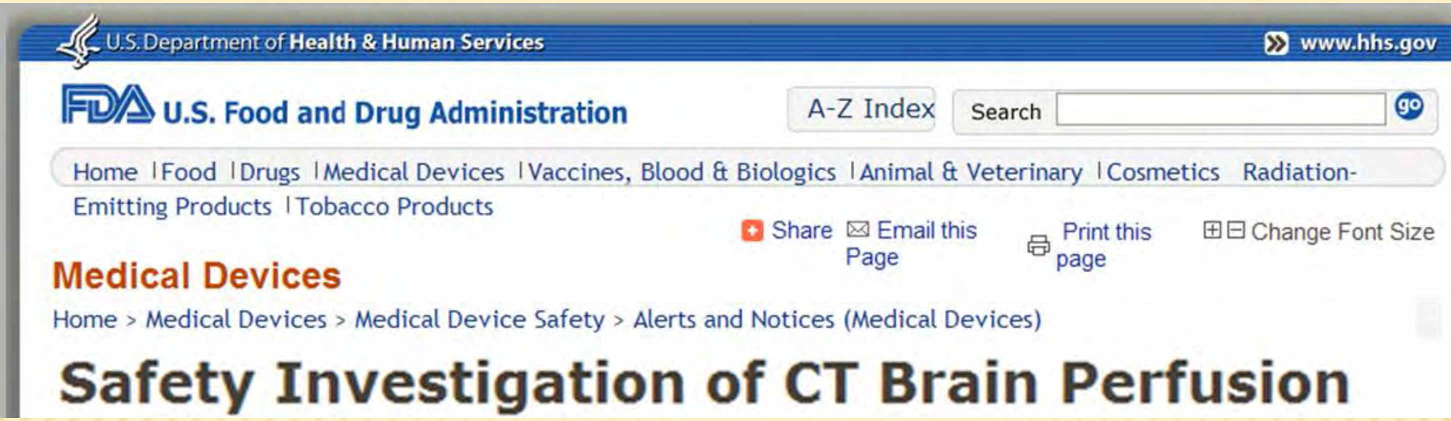
Actual Size
of Vita Radium

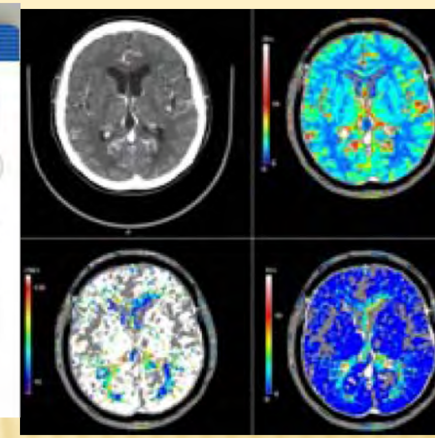
Show Mom How You Really Feel About Her……
Give Her a Total Body CT!!

More Meaningful than Flowers….

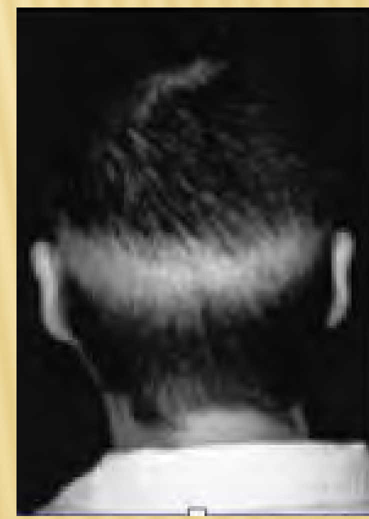
Eff. Dose ≅ 15-20 mSv

Show her you want to love her forever ….





October 2009

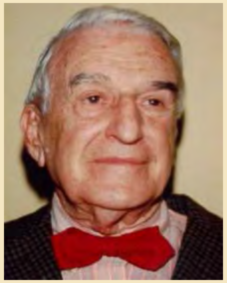


Occurred at Several Hospitals—Was the Problem the Operators or the Equipment?

Why Was the NCRP and Similar Organizations Created?

Because there was…..as still is a need for radiation protection of workers, patients and the public

NCRP HISTORY

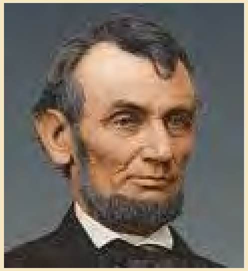


Lauriston S. Taylor
1929 – 1977
48 years

1928

International X-ray and Radium Protection Committee
2nd International Congress of Radiology in Stockholm

Warren K. Sinclair
1977 – 1991
14 years



1929

U.S. Advisory Committee on X-ray and Radium Protection

Charles B. Meinhold
1991 – 2002
11 years

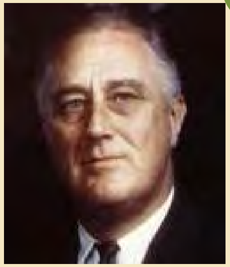
1946

U.S. National Committee on Radiation Protection

1964

National Council on Radiation Protection and Measurements chartered by U.S. Congress (Public Law 88-376)

Thomas S. Tenforde
2002 – 2012
10 years



Great Presidents

John D. Boice, Jr.
2012 –

NCRP Congressional Charter
Public Law 88-376—July 14, 1964

Public Law 88-376

July 14, 1964
[H. R. 10437]

AN ACT

To incorporate the National Committee on Radiation Protection and Measurements.

National Council on Radiation Protection and Measurements, Incorporation.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That—

C. M. Barnes, Rockville, Maryland;
E. C. Barnes, Edgewood, Pennsylvania;
V. P. Bond, Setauket, Long Island, New York;
C. B. Braestrup, New York, New York;
J. T. Brennan, Bethesda, Maryland;
L. T. Brown, Bethesda, Maryland;
R. F. Brown, San Francisco, California;
F. R. Bruce, Oak Ridge, Tennessee;
J. C. Bugher, Rio Piedras, Puerto Rico;
D. R. Chadwick, Upper Marlboro, Maryland;
R. H. Chamberlain, Philadelphia, Pennsylvania;
J. F. Crow, Madison, Wisconsin;
R. L. Doan, Idaho Falls, Idaho;
C. L. Dunham, Washington, District of Columbia;
T. C. Evans, Iowa City, Iowa;
E. G. Fuller, Bethesda, Maryland;
R. O. Gorson, Philadelphia, Pennsylvania;
J. W. Healy, Chappaqua, New York;
P. C. Hodges, Chicago, Illinois;
A. R. Keene, Richland, Washington;
M. Kleinfeld, Brooklyn, New York;
H. W. Koch, Silver Spring, Maryland;

and their successors, are hereby created and declared to be a body corporate, by name of the National Council on Radiation Protection and Measurements (hereinafter called the corporation), and by such name shall be known, and have perpetual succession and the powers, limitations, and restrictions contained in this Act.

COMPLETION OF ORGANIZATION

SEC. 2. The persons named in the first section of this Act are authorized to complete the organization of the corporation by the selection of officers and employees, the adoption of bylaws, not inconsistent with this Act, and the doing of such other acts as may be necessary for such purpose.

OBJECTS AND PURPOSES OF CORPORATION

SEC. 3. The objects and purposes of the corporation shall be—

(1) to collect, analyze, develop, and disseminate in the public interest information and recommendations about (a) protection against radiation (referred to herein as "radiation protection"), and (b) radiation measurements, quantities, and units, particularly those concerned with radiation protection;

(2) to provide a means by which organizations concerned with the scientific and related aspects of radiation protection and of radiation quantities, units, and measurements may cooperate for effective utilization of their combined resources, and to stimulate the work of such organizations;

(3) to develop basic concepts about radiation quantities, units, and measurements, about the application of these concepts, and about radiation protection;

(4) to cooperate with the International Commission on Radi-

NCRP was chartered by the U.S. Congress as a nonprofit organization to address the radiation protection needs of the nation

Other organizations with similar congressional charters include:

The American Red Cross

American Red Cross

Together, we can save a life

The Boy Scouts of America

BOY SCOUTS OF AMERICA · BE PREPARED

The National Academy of Sciences.

First Formal Meeting of Congressionally Charted National Council on Radiation Protection and Measurements

31 of the 49 Council Members, were present for this photograph

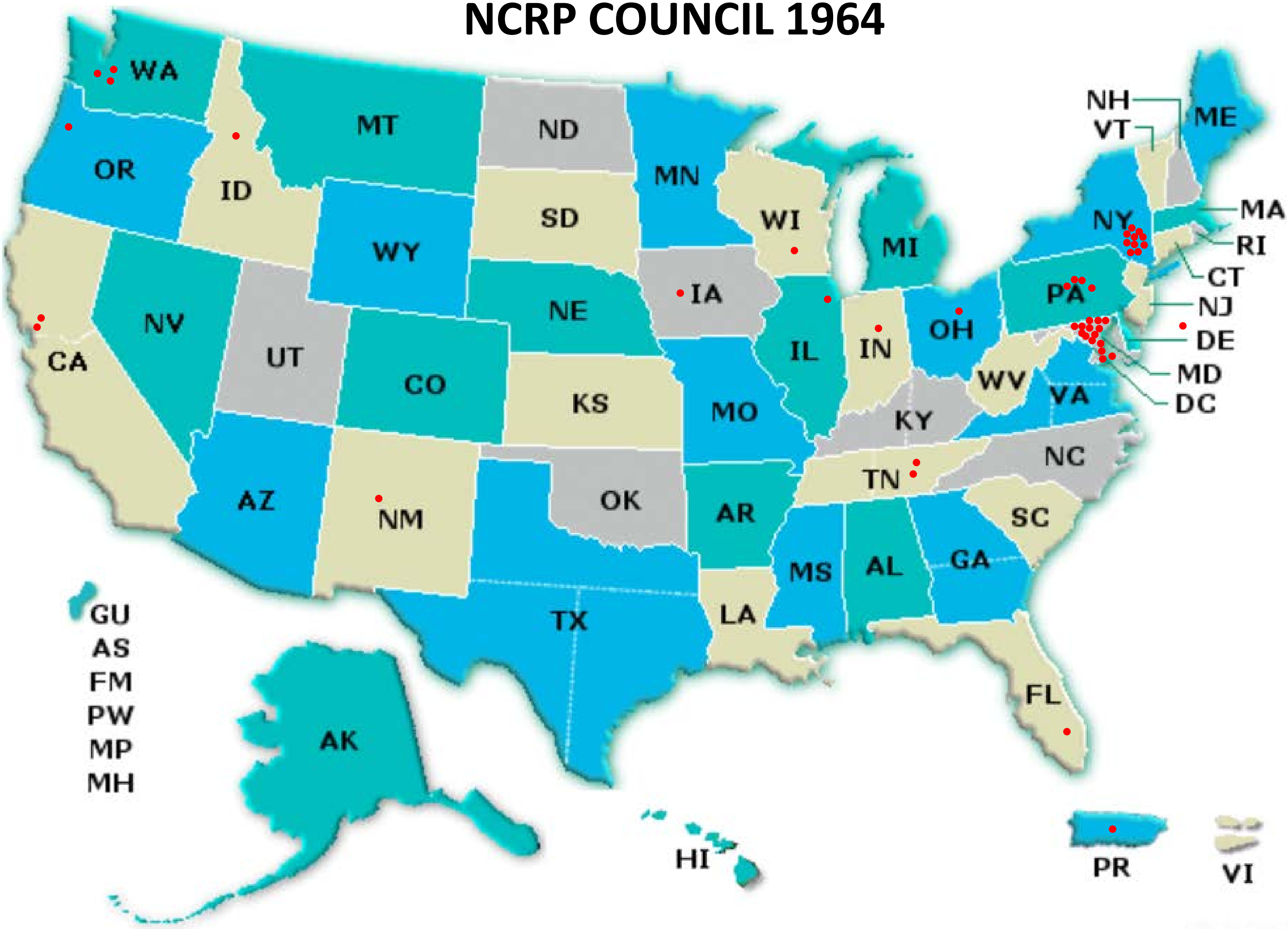
1937

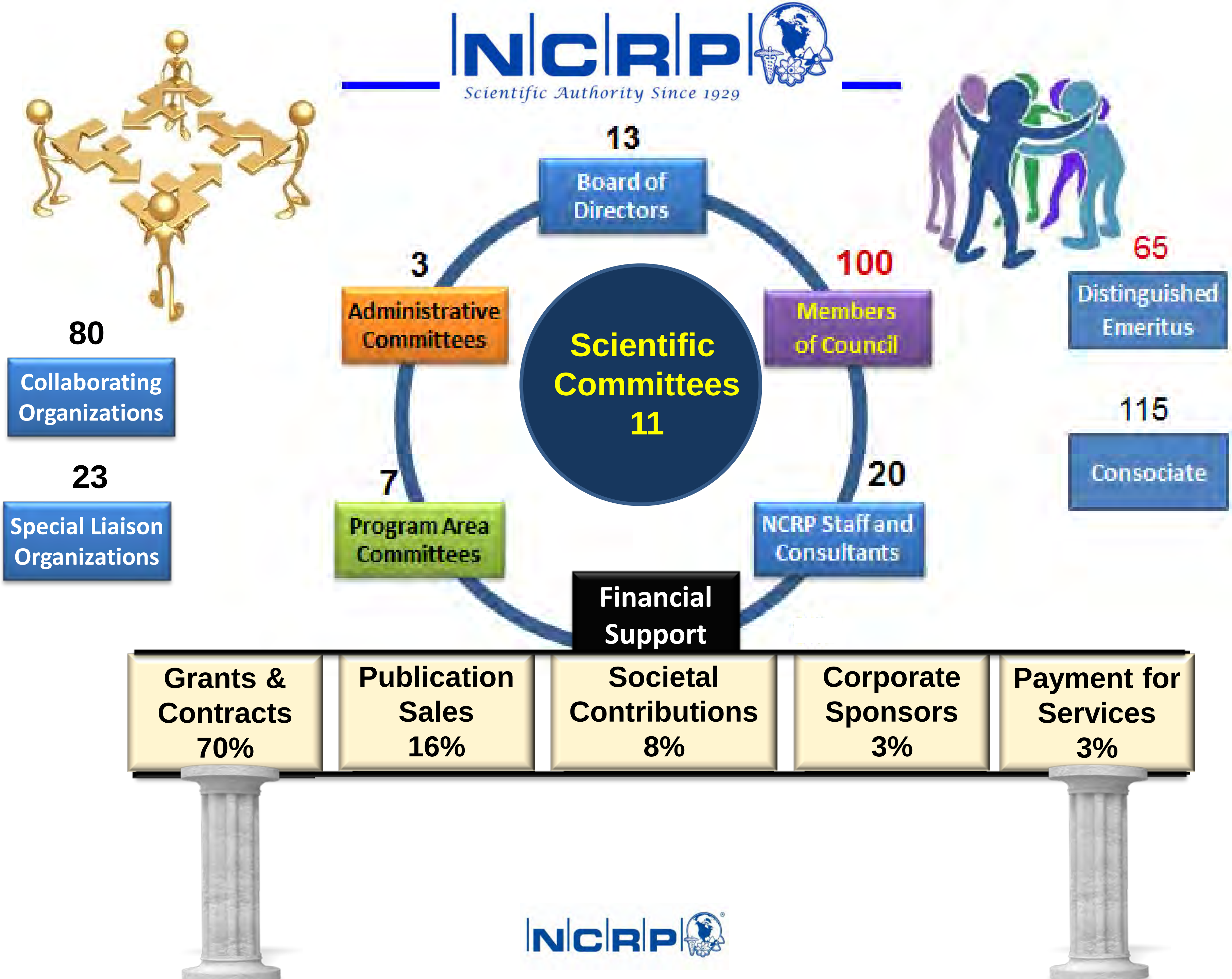
August 3, 1964

Mayflower Hotel

Washington, DC

NCRP COUNCIL 1964




NCRP
Scientific Authority Since 1929
13
Board of Directors
3
Administrative Committees
100
Members of Council
65
Distinguished Emeritus
80
Collaborating Organizations
Scientific Committees 11
115
Consociate
23
Special Liaison Organizations
7
Program Area Committees
20
NCRP Staff and Consultants
Financial Support
Grants & Contracts 70%
Publication Sales 16%
Societal Contributions 8%
Corporate Sponsors 3%
Payment for Services 3%
NCRP

Council Areas of Expertise

- Accelerators
- Behavioral effects
- Biodosimetry
- Cancer biology
- Dentistry
- Dose Reconstruction
- Dosimetry
- Embryology and Teratology
- Environment
- Epidemiology
- Epigenetics
- Ethics
- Nuclear Fuel cycle
- Genetics
- Genetic susceptibility
- Health physics
- Health physics
- Interventional medical procedures
- Late tissue reactions
- Medical physics (Nuc Med/Dx/Therapy)
- Molecular biology
- Noncancer effects
- Nonionizing radiation
- NORM
- Nuclear engineering
- Nuclear medicine
- Occupational medicine
- Physics
- Public health
- Public policy
- Radiation measurements
- Radiation oncology
- Reactor technology
- Regulations/regulatory
- Radiobiology
- Radiological emergency response
- Radiology
- Risk analysis/assessment
- Risk Communications
- Safety analysis
- Statistics
- Nuclear medicine
- Toxicology
- Ultrasound
- Waste management (nuclear & mixed)

NCRP Congressional Charter
Public Law 88-376—July 14, 1964

August 3, 1964

Public Law 88-376

July 14, 1964
[H. R. 10437]

AN ACT

To incorporate the National Committee on Radiation Protection and Measurements.

National Council on Radiation Protection and Measurements, Incorporation.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That—

C. M. Barnes, Rockville, Maryland;
E. C. Barnes, Edgewood, Pennsylvania;
V. P. Bond, Setauket, Long Island, New York;
C. B. Braestrup, New York, New York;
J. T. Brennan, Bethesda, Maryland;
L. T. Brown, Bethesda, Maryland;
R. F. Brown, San Francisco, California;
F. R. Bruce, Oak Ridge, Tennessee;
J. C. Bugher, Rio Piedras, Puerto Rico;
D. R. Chadwick, Upper Marlboro, Maryland;
R. H. Chamberlain, Philadelphia, Pennsylvania;
J. F. Crow, Madison, Wisconsin;
R. L. Doan, Idaho Falls, Idaho;
C. L. Dunham, Washington, District of Columbia;
T. C. Evans, Iowa City, Iowa;
E. G. Fuller, Bethesda, Maryland;
R. O. Gorson, Philadelphia, Pennsylvania;
J. W. Healy, Chappaqua, New York;
P. C. Hodges, Chicago, Illinois;
A. R. Keene, Richland, Washington;
M. Kleinfeld, Brooklyn, New York;
H. W. Koch, Silver Spring, Maryland;
D. I. Livermore, Washington, District of Columbia;
G. V. LeRoy, Chicago, Illinois;
W. B. Mann, Chevy Chase, Maryland;
W. A. McAdams, Schenectady, New York;
G. W. Morgan, Kensington, Maryland;
K. Z. Morgan, Oak Ridge, Tennessee;
H. J. Muller, Bloomington, Indiana;
R. J. Nelsen, Rockville, Maryland;
R. R. Newell, San Francisco, California;
W. D. Norwood, Richland, Washington;
H. M. Parker, Richland, Washington;
C. Powell, Bethesda, Maryland;
E. H. Quimby, New York, New York;
J. C. Reeves, Gainesville, Florida;
R. Robbins, Philadelphia, Pennsylvania;
H. H. Rossi, Nyack, New York;
E. L. Saenger, Cincinnati, Ohio;
T. L. Shipman, Los Alamos, New Mexico;
P. J. Shore, Patchogue, New York;
J. H. Sterner, Rochester, New York;
R. S. Stone, San Francisco, California;
L. S. Taylor, Bethesda, Maryland;
E. D. Trout, Corvallis, Oregon;
B. F. Trum, Boston, Massachusetts;
Shields Warren, Boston, Massachusetts;
E. G. Williams, Jacksonville, Florida;
H. O. Wyckoff, Silver Spring, Maryland;

and their successors, are hereby created and declared to be a body corporate, by name of the National Council on Radiation Protection and Measurements (hereinafter called the corporation), and by such name shall be known, and have perpetual succession and the powers, limitations, and restrictions contained in this Act.

COMPLETION OF ORGANIZATION

SEC. 2. The persons named in the first section of this Act are authorized to complete the organization of the corporation by the selection of officers and employees, the adoption of bylaws, not inconsistent with this Act, and the doing of such other acts as may be necessary for such purpose.

OBJECTS AND PURPOSES OF CORPORATION

SEC. 3. The objects and purposes of the corporation shall be—

(1) to collect, analyze, develop, and disseminate in the public interest information and recommendations about (a) protection against radiation (referred to herein as "radiation protection"), and (b) radiation measurements, quantities, and units, particularly those concerned with radiation protection;

(2) to provide a means by which organizations concerned with the scientific and related aspects of radiation protection and of radiation quantities, units, and measurements may cooperate for effective utilization of their combined resources, and to stimulate the work of such organizations;

(3) to develop basic concepts about radiation quantities, units, and measurements, about the application of these concepts, and about radiation protection;

(4) to cooperate with the International Commission on Radiological Protection, the Federal Radiation Council, the International Commission on Radiological Units and Measurements, and other national and international organizations, governmental and private, concerned with radiation quantities, units, and measurements and with radiation protection.

POWERS OF CORPORATION

SEC. 4. The corporation shall have power—

(1) To sue and be sued, complain and defend in any court of competent jurisdiction.

(2) To adopt, alter, and use a corporate seal.

(3) To choose such officers, directors, trustees, managers, agents, and employees as the business of the corporation may require.

(4) To adopt, amend, and alter bylaws not inconsistent with the laws of the United States of America or of any State in which the corporation is to operate, for the management of its property and the regulation of its affairs.

(5) To make contracts.

(6) To take and hold by lease, gift, purchase, grant, devise, or bequest, or by any other method, any property, real or personal, necessary or proper for attaining the objects and carrying into effect the purposes of the corporation, subject, however, to applicable provisions of law of any State or the District of Columbia (a) governing the amount or kind of such property which may be held by, or (b) otherwise limiting or controlling the ownership of any such property by a corporation operating in such State or the District of Columbia.

Key Elements of NCRP's Charter U.S. Public Law 88-376: :

I. Collect

II. Analyze

III. Develop

IV. Disseminate

information and recommendations ***in the public interest*** about:

Objective & Purpose

- **Protection Against Radiation**
- **Radiation Measurements, Quantities and Units**

Key Elements of NCRP's Charter
U.S. Public Law 88-376

Objective & Purpose

- Facilitate effective use of combined resources of organizations concerned with radiation protection; and
- Cooperate with national and international governmental and private organizations; and

Additional Roles

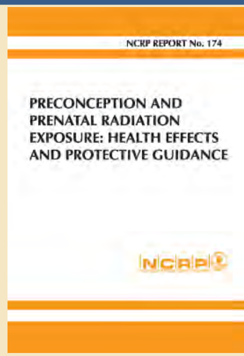
- General scientific services such as conducting scientific symposia, performing independent technical reviews, development of training materials, and performing/overseeing scientific research.

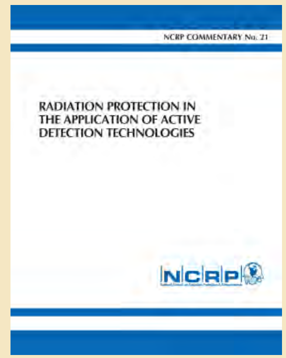
Key Elements of NCRP's Charter
U.S. Public Law 88-376

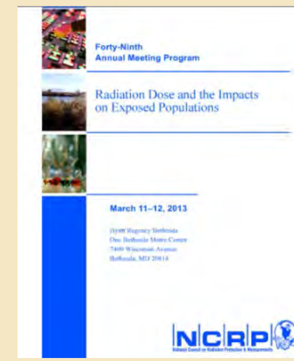
Collect / Analyze / Develop

- NCRP Scientific Committees
- The NCRP Council

Key Elements of NCRP's Charter
U.S. Public Law 88-376
Traditional Dissemination Approaches

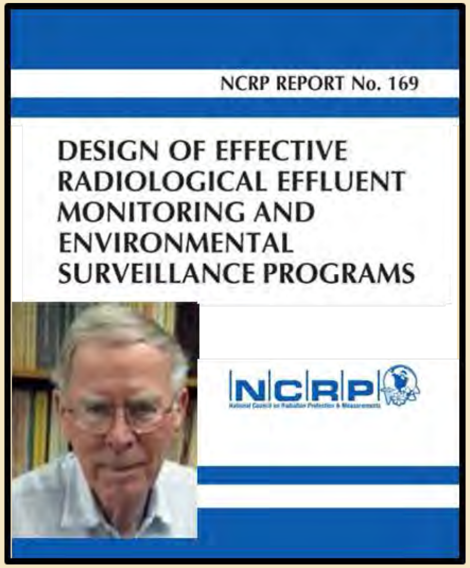


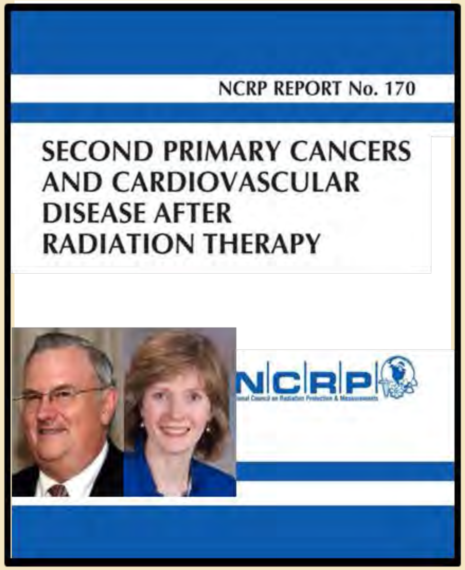


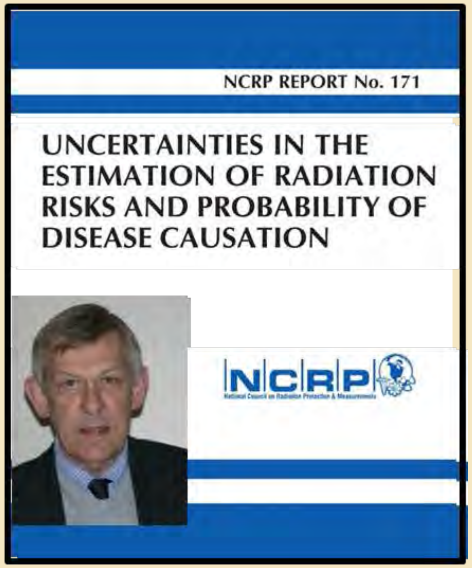


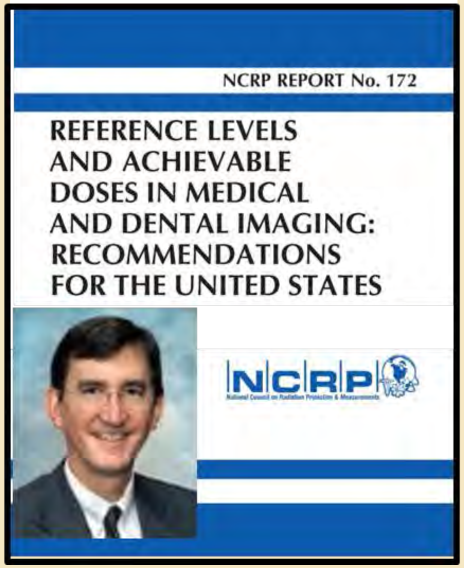
- **NCRP Publications:**
  (e.g., Reports—Commentaries—Statements Presidential Letter Reports, Annual Scientific Meetings & Published Proceedings)
- **Government & Public Consultation:**
  (e.g., Formal Testimony or Informal Opinion in Response to Governmental Inquiry & Response to the Media and Individual Citizens that have questions related to some aspect of RP&M

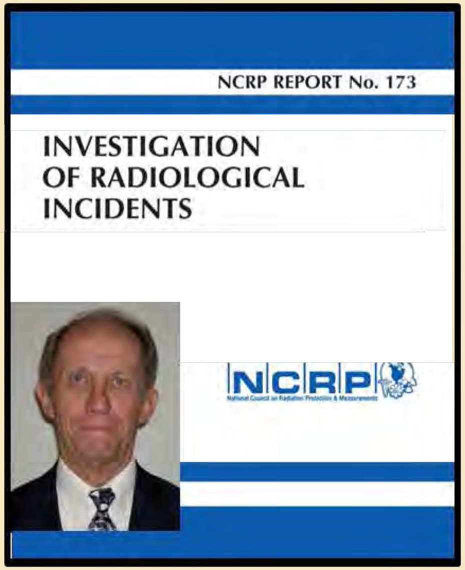
Recent NCRP Reports

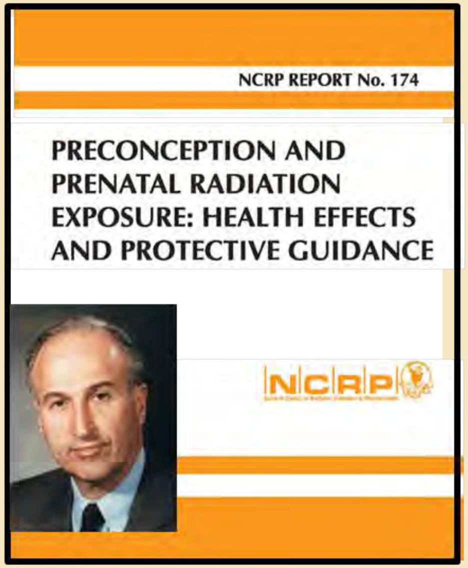




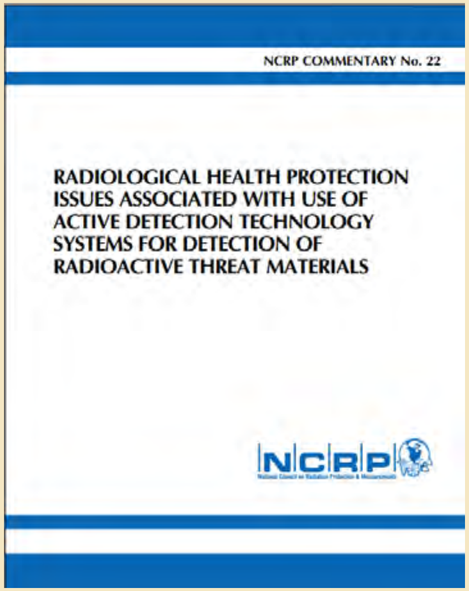








Commentaries, Statements and Letter Reports



NCRP COMMENTARY No. 22

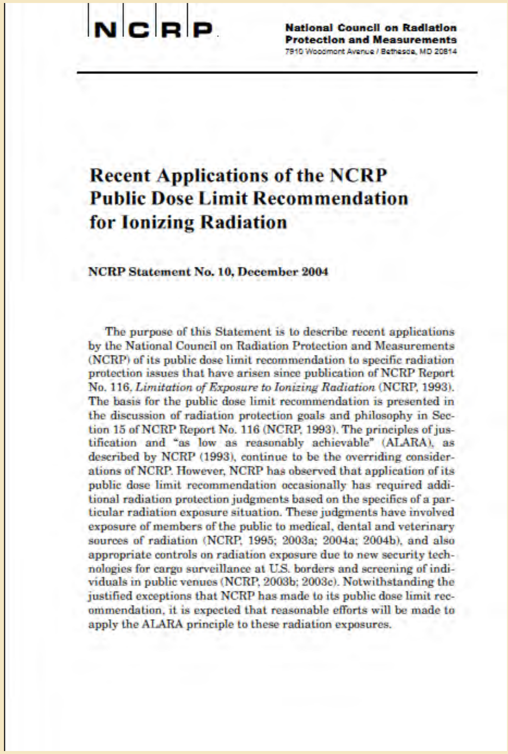
RADIOLOGICAL HEALTH PROTECTION ISSUES ASSOCIATED WITH USE OF ACTIVE DETECTION TECHNOLOGY SYSTEMS FOR DETECTION OF RADIOACTIVE THREAT MATERIALS

NCRP

Commentary

- Preliminary evaluations, critiques, reviews of specific topics
- Extensions of previously published NCRP reports on an accelerated schedule
- Approval is by the Board of Directors

- More concise than NCRP reports, up to four pages
- Equivalent to NCRP Reports Council & BOD Review



NCRP

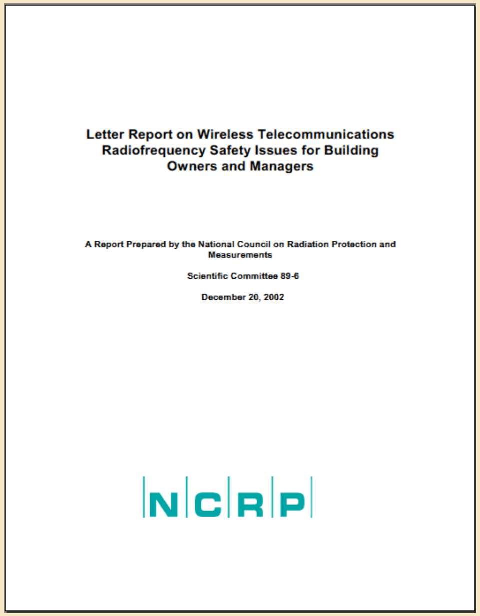
National Council on Radiation Protection and Measurements
7910 Woodmont Avenue / Bethesda, MD 20814

Recent Applications of the NCRP Public Dose Limit Recommendation for Ionizing Radiation

NCRP Statement No. 10, December 2004

The purpose of this Statement is to describe recent applications by the National Council on Radiation Protection and Measurements (NCRP) of its public dose limit recommendation to specific radiation protection issues that have arisen since publication of NCRP Report No. 116, *Limitation of Exposure to Ionizing Radiation* (NCRP, 1993). The basis for the public dose limit recommendation is presented in the discussion of radiation protection goals and philosophy in Section 15 of NCRP Report No. 116 (NCRP, 1993). The principles of justification and "as low as reasonably achievable" (ALARA), as described by NCRP (1993), continue to be the overriding considerations of NCRP. However, NCRP has observed that application of its public dose limit recommendation occasionally has required additional radiation protection judgments based on the specifics of a particular radiation exposure situation. These judgments have involved exposure of members of the public to medical, dental and veterinary sources of radiation (NCRP, 1995; 2003a; 2004a; 2004b), and also appropriate controls on radiation exposure due to new security technologies for cargo surveillance at U.S. borders and screening of individuals in public venues (NCRP, 2003b; 2003c). Notwithstanding the justified exceptions that NCRP has made to its public dose limit recommendation, it is expected that reasonable efforts will be made to apply the ALARA principle to these radiation exposures.

Statements



Letter Report on Wireless Telecommunications Radiofrequency Safety Issues for Building Owners and Managers

A Report Prepared by the National Council on Radiation Protection and Measurements

Scientific Committee 89-6

December 20, 2002

NCRP

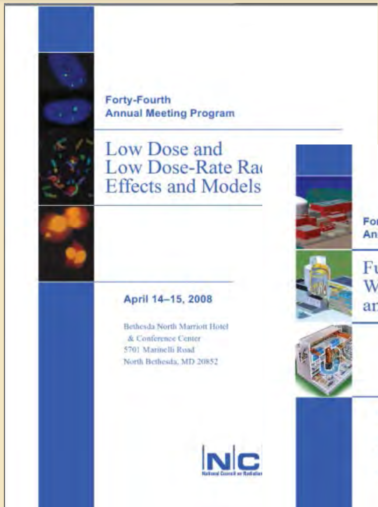
Presidential Letter Reports

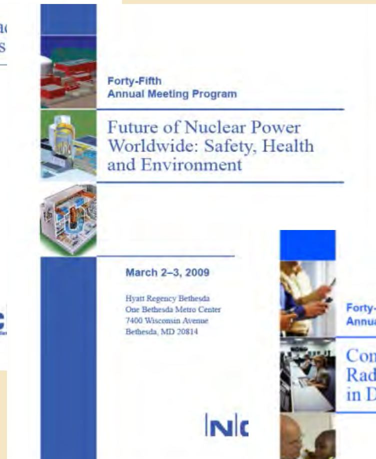
- Developed by a scientific committee
- Reviewed by Council
- Approved for publication by the President.

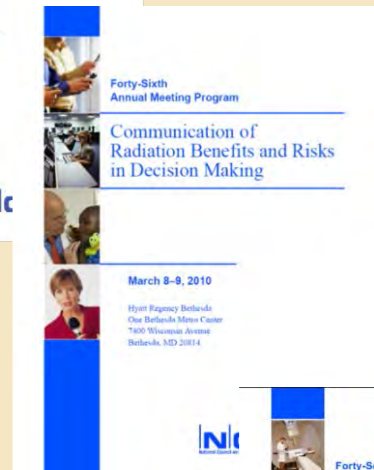
Proceedings of Annual Meeting

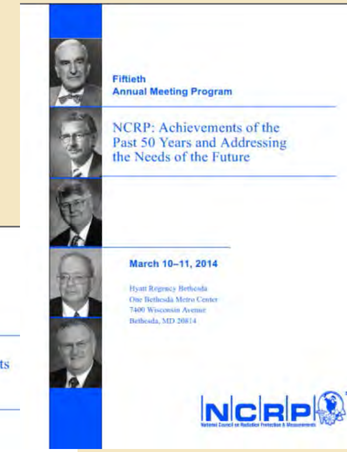
2008-2014

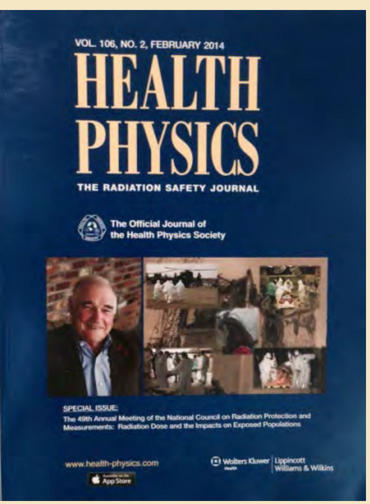
Peer Review & Published in Health Physics





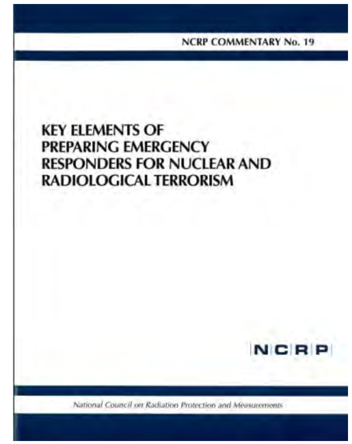






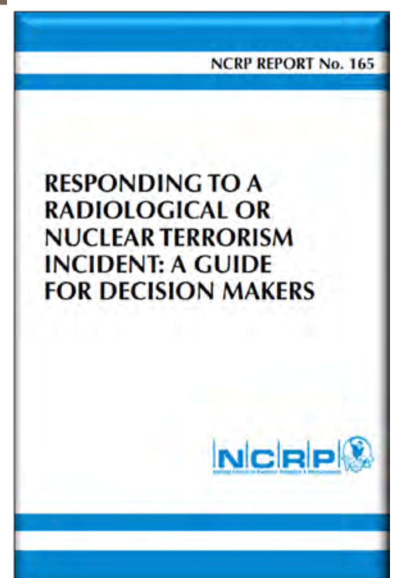
Radiological Emergency Management
NCRP Reports 138, 165, 165 &166
Commentary 19

2001

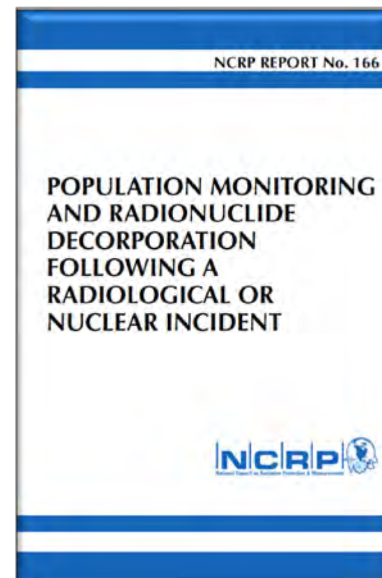


2005

2008



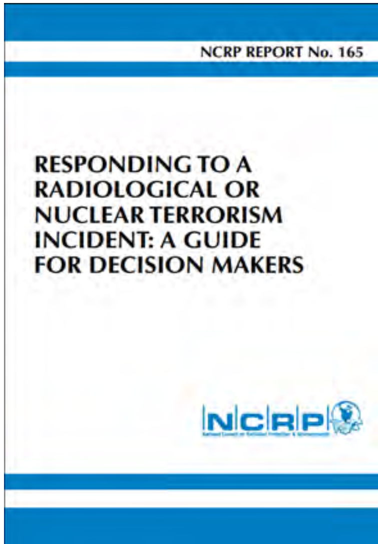
2010



2010

NCRP Report 165

- **Fills a gap in earlier NCRP reports by addressing Public Health (PH) response**
- **Comprehensive guidance for PH & medical response preparations**
  - triage, treatment, decontamination contaminated deceased
  - population monitoring,
  - staffing & facility preparations
  - facility recovery rad waste
- **Describes a scalable approach to response activities**



Persistent Problems
Decon Prior to Transport

- Current practice of responding and treating victims of a radiation incident falls within the response to generalized hazardous materials

- Hazardous material policy in the most regions (1st responders, EMS Transport and Hospitals) requires *all contaminated victims of a hazardous materials incident to be decontaminated prior to medical treatment or transport*

Wounds With Embedded High Dose Rate Micro-Shrapnel The Exception to the Rule

- Detonation of RDD can result in microshrapnel (mm) w GBq to TBq
- Extraordinarily high exposure rates
- Staff dose 0.1-1 Sv/ hr at 0.5 m (Co-60)
- GM & Ion Chamber Useless in Localization of Source
- Rapidly locating and removing these radioactive sources, will be an essential part of the emergency medical management of these patients.

Persistent Problems

Preservation of Critical Assets

- In a mass causality event it is *vital that critical assets are not taken out of service due to low levels of radioactive contamination*.
  - Critical assets such as EMS patient transport vehicles, life flight, trauma rooms, etc. ***should not*** be taken out of service if there is a critical need to use them.
  - The risks to the patients and staff are minimal.
  - Restricting these resources may result in unnecessary loss of life.
  - Dose to Staff & patient from contamination is typically low and relatively easy to detect and remove





Persistent Problems
Care of Psychological Casualties

- Terrorist acts involving toxic agents (especially radiation) are perceived as very threatening
- Mass casualty incidents caused by nuclear terrorism will create large numbers of worried people who may not be injured or contaminated
- Providing psychological support on this scale is challenging

Effective Crisis Communications

Rudolph Giuliani responding to a question shortly after 9/11 about how many people lost their lives

Effective Crisis Communications

"…more than any of us can bear"

Empathy Before Facts

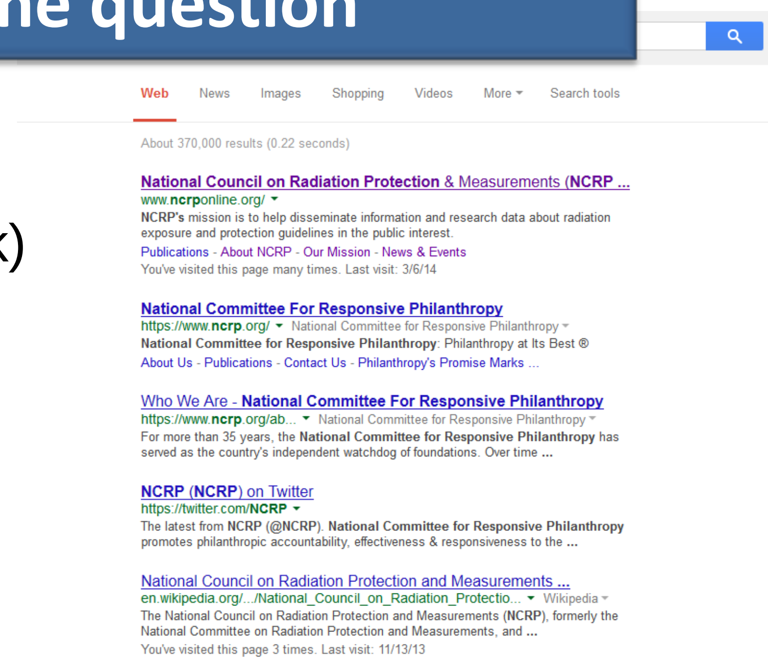
People Need to Know you Care

Before they Care about what you Know

Key Elements of NCRP's Charter
U.S. Public Law 88-376: Objective & Purpose:
New Initiatives In Dissemination

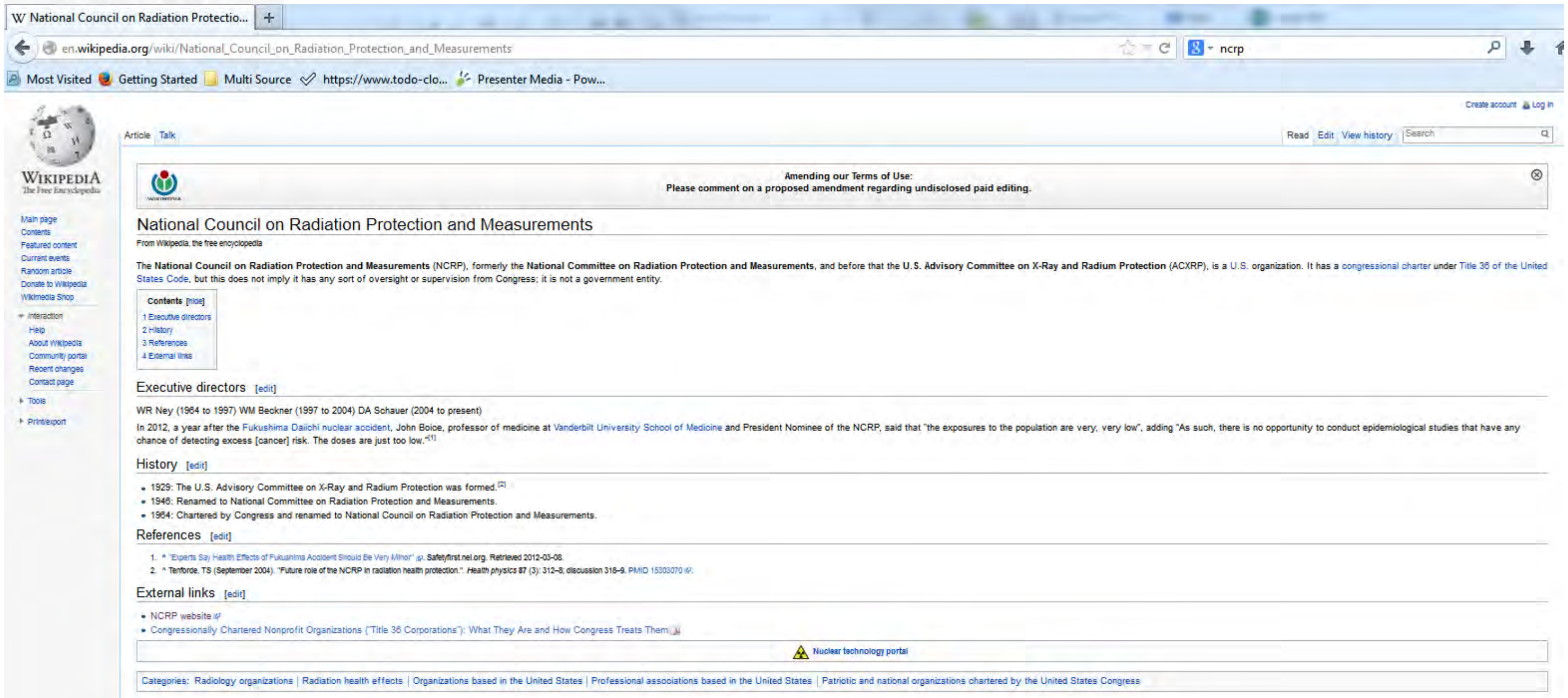
Nobody cares that you have the answer if your not there, when and where they are asking the question

- Enhanced Web Presence
- Social Media (e.g., Twitter/Facebook)



NCRP

NCRP INFO Wikipedia



W National Council on Radiation Protectio...

en.wikipedia.org/wiki/National_Council_on_Radiation_Protection_and_Measurements

Most Visited | Getting Started | Multi Source | https://www.todo-clo... | Presenter Media - Pow...

Create account | Log in

Article | Talk | Read | Edit | View history

Amending our Terms of Use:
Please comment on a proposed amendment regarding undisclosed paid editing.

National Council on Radiation Protection and Measurements

From Wikipedia, the free encyclopedia

The **National Council on Radiation Protection and Measurements** (NCRP), formerly the **National Committee on Radiation Protection and Measurements**, and before that the **U.S. Advisory Committee on X-Ray and Radium Protection** (ACXRP), is a U.S. organization. It has a congressional charter under Title 36 of the United States Code, but this does not imply it has any sort of oversight or supervision from Congress; it is not a government entity.

Contents [hide]

Executive directors [edit]

WR Ney (1964 to 1997) WM Beckner (1997 to 2004) DA Schauer (2004 to present)

In 2012, a year after the Fukushima Daiichi nuclear accident, John Boice, professor of medicine at Vanderbilt University School of Medicine and President Nominee of the NCRP, said that "the exposures to the population are very, very low", adding "As such, there is no opportunity to conduct epidemiological studies that have any chance of detecting excess [cancer] risk. The doses are just too low."[1]

History [edit]

- 1929: The U.S. Advisory Committee on X-Ray and Radium Protection was formed.[2]
- 1946: Renamed to National Committee on Radiation Protection and Measurements.
- 1964: Chartered by Congress and renamed to National Council on Radiation Protection and Measurements.

References [edit]

1. ^ "Experts Say Health Effects of Fukushima Accident Should Be Very Minor". Safetyfirst.nel.org. Retrieved 2012-03-08.
2. ^ Tenforde, TS (September 2004). "Future role of the NCRP in radiation health protection.". *Health physics* 87 (3): 312–8; discussion 318–9. PMID 15303070.

External links [edit]

- NCRP website
- Congressionally Chartered Nonprofit Organizations ("Title 36 Corporations"): What They Are and How Congress Treats Them

Nuclear technology portal

Categories: Radiology organizations | Radiation health effects | Organizations based in the United States | Professional associations based in the United States | Patriotic and national organizations chartered by the United States Congress

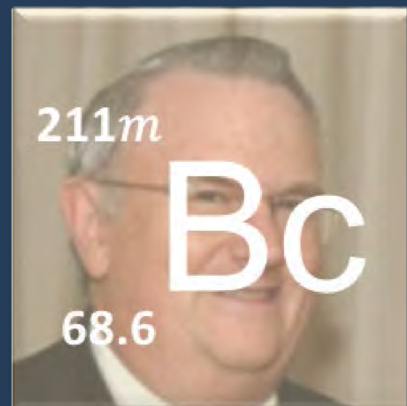
People Often Don't Make it Past the First Page

We Could & Should Do Better

Key Elements of NCRP's Charter
U.S. Public Law 88-376: Objective & Purpose:
New Initiatives In Dissemination

How Would You Characterize
Impact of Dr. Boice's Leadership?

Boiceinium ($^{211m}_{68.6}\mathrm{Bc}$)



Boiceinium-211

I. It would have an **Atomic Number** of 68.6 (yes I know it's a little unusual).

II. **Atomic Mass** of 211 (sometimes more sometimes less).

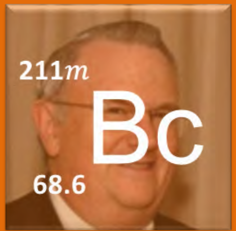
Similar Radionuclidic Characteristics

- Long Half-life: Emits Energy for Long Periods with little noticeable decrease in activity.
- There would be multiple forms of energy emissions which are capable of Depositing Energy both Locally & at a Distance
- Can exist in both Stable & Metastable Forms
- When handled properly there are many societal benefits from its use.

Boiceinium-211

Dismilar Radionuclidic Characteristics

- Its composed of many dissimilar atoms (some of which are radioactive while others are not)
- To this point IARC has not classified the energy emitted to be a Group I carcinogen
- It periodically (an often unexpectedly) undergoes transformation w/o decay into many other forms each with their own unique properties and applications
- Finally, it can be used safely without a dosimeter or protective clothing but clothing is definitely recommended



Boiceinium-211

NCRP President's Column "The Boice Report" in the Monthly Health Physics Newsletter

The Boice Report #17

NCRP
National Council on Radiation Protection & Measurements

John D. Boice, Jr., NCRP President
ICRP Main Commissioner, UNSCEAR Delegation
Veterans' Advisory Board on Dose Reconstruction Board Member
Vanderbilt Professor of Medicine

2014 NCRP Annual Meeting—Bethesda, Maryland
Celebrating 50 Years Since Congressional Charter in 1964

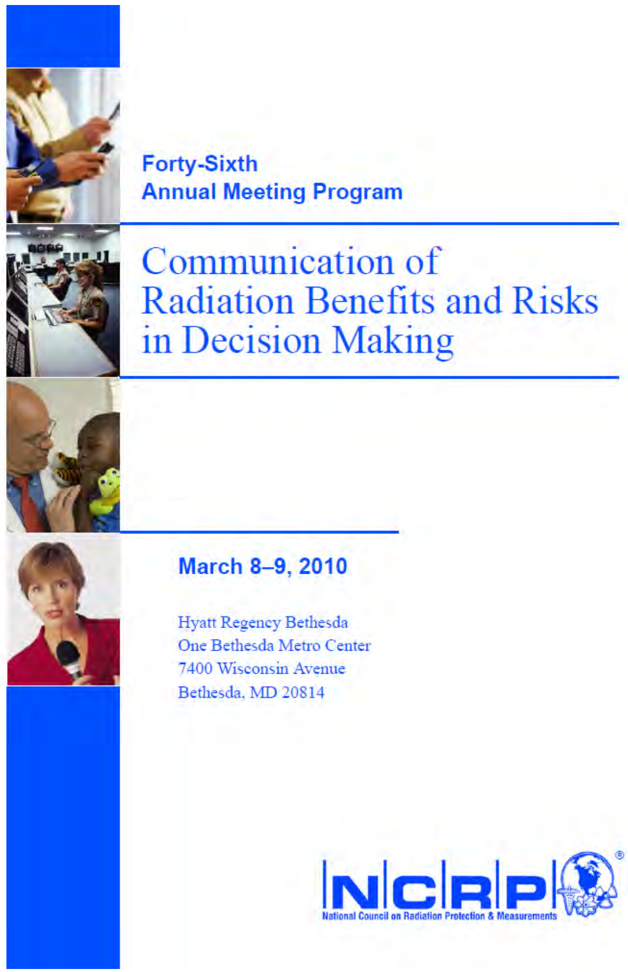
The year of the great stock market crash—1929—was also the year that the U.S. Advisory Committee on X-Ray and Radium Protection, the predecessor organization to the National Council on Radiation Protection and Measurements (NCRP), was founded. In 1946 it morphed into the U.S. National Committee on Radiation Protection and then in 1964 NCRP was chartered by the U.S. Congress as a nonprofit organization to address the radiation protection needs of the nation. NCRP is in good company in that organizations with similar congressional charters include the American Red Cross, the Boy Scouts of America, and the National Academy of Sciences. Next year NCRP will celebrate the 50th year since its congressional charter (Sinclair 1988; Taylor 2002; Meinhold 2004; Tenforde 2004; Boice 2014). So save the date for a celebration that will recall past achievements with a view to addressing the needs for the future!

The Omnipresent President

- ICRP Main Commission
- UNSCEAR Delegate
- Senior Editor Radiation Research
- Countless Invited Speaking Engagements and Media Interviews
- Congressional Testimony
- Consultations & Briefings: : IAEA ,WHO

  CDC, FDA, NRC, DOE, EPA, DOD, etc

Communication of Radiation Benefits and Risks in Decision Making



Proceedings of 2010 Annual Meeting to be published in Health Physics, 2011

Models of Radiation Induced Cancer

The magnitude of this uncertainty pales in comparison to our uncertainty of how best to communicate what we do know.

Guidance in Emergency Medicine Partnership with American College of Emergency Physicians

NCRP is grateful to the EPA for financial support.

Published in JACR and Annuals of EM in 2014

Applications of Justification and Optimization in Medical Imaging:

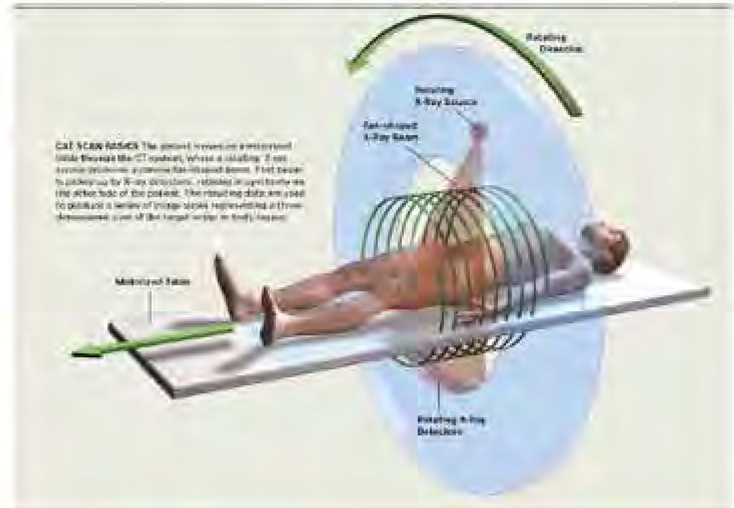
Examples of Clinical Guidance for Computed Tomography Use in Emergency Medicine

Paul R. Sierzenski, MD, RDMS[a], Otha W. Linton, MSJ[b], E. Stephen Amis Jr, MD[c], D. Mark Courtney, MD[d], Paul A. Larson, MD[e], Mahadevappa Mahesh, MS, PhD[f], Robert A. Novelline, MD[g], Donald P. Frush, MD[h], Fred A. Mettler, MD[i], Julie K. Timins, MD[j], Thomas S. Tenforde, MD[k], John D. Boice Jr, ScD[k], James A. Brink, MD[l], Jerrold T. Bushberg, MD[m], David A. Schauer, ScD[k,*]

CT

e

is, MD



IMAGING/CONCEPTS

Applications of Justification and Optimization in Medical Imaging: Examples of Clinical Guidance for Computed Tomography Use in Emergency Medicine

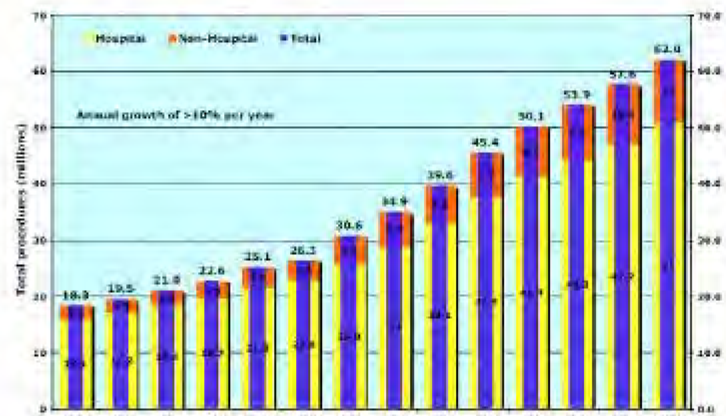
Paul R. Sierzenski, MD, RDMS; Otha W. Linton, MSJ; E. Stephen Amis, Jr., MD; D. Mark Courtney, MD; Paul A. Larson, MD; Mahadevappa Mahesh, MS, PhD; Robert A. Novelline, MD; Donald P. Frush, MD; Fred A. Mettler, MD; Julie K. Timins, MD; Thomas S. Tenforde, MD; John D. Boice, Jr., ScD; James A. Brink, MD; Jerrold T. Bushberg, MD; David A. Schauer, ScD*

Availability, reliability, and technical improvements have led to continued expansion of computed tomography (CT) imaging. During a CT scan, there is substantially more exposure to ionizing radiation than with conventional radiography. This has led to questions and critical conclusions about whether the continuous growth of CT scans should be subjected to review and potentially restraints or, at a minimum, closer investigation. This is particularly pertinent to populations in emergency departments, such as children and patients who receive repeated CT scans for benign diagnoses. During the last several decades, among national medical specialty organizations, the American College of Emergency Physicians and the American College of Radiology have each formed membership working groups to consider value, access, and expedience and to promote broad acceptance of CT protocols and procedures within their disciplines. Those efforts have had positive effects on the use criteria for CT by other physician groups, health insurance carriers, regulators, and legislators. [Ann Emerg Med. 2014;63:25-32.]

A podcast for this article is available at www.annemergmed.com.

0196-0644/$-see front matter

http://dx.doi.org/10.1016/j.annemergmed.2013.08.027



62 Million in 2006
85 Million in 2011

ALADA

- While many lives have been saved by advancements in imaging technology
- Radiation used in Medical Imaging, is now the **single most controllable source of radiation exposure**
- Continued improvement in justification and optimization are important to keep these exposures **As Low as Diagnostically Acceptable (ALADA)**
- ALADA is proposed as a variation of the acronym ALARA to emphasize the importance of optimization in medical imaging (lower is not always better).

THE MESSAGE IS *NOT JUST ABOUT THE FACTS BUT HOW THEY ARE PRESENTED*

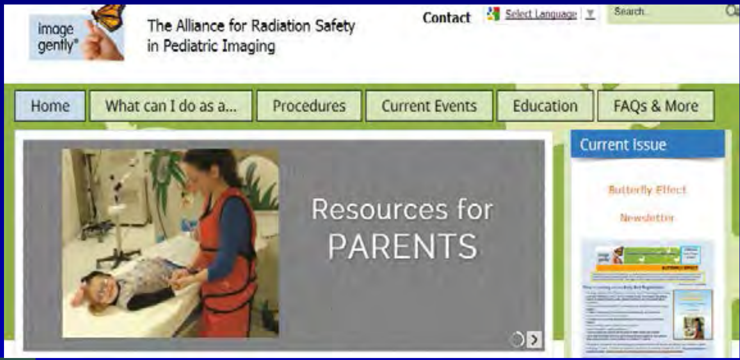
After a pelvic CT scan of a pregnant woman, which statement delivers the most appropriate message about risk?

A. **"The study that you had two weeks ago has perhaps doubled the risk that your child will develop cancer before age 19. [0.6% vs 0.3%]"**

B. **"The risk of adverse outcome is very small and the likelihood of normal development is nearly the same as it is for any child. [96.7% vs 96.4%]"**

Are Professionals Sending the Right Message?

THE GOOD



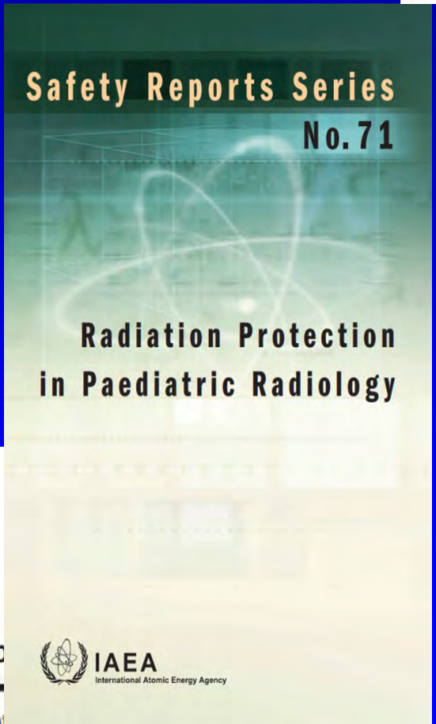


Image Gently, Step Lightly: Promoting Radiation Safety in Pediatric Interventional Radiolo

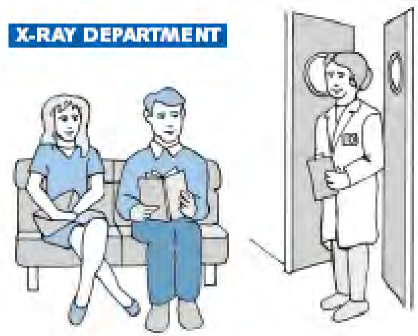
OBJECTIVE. The *Image Gently*, Step Lightly campaign is an education and ... campaign focusing on radiation safety in pediatric interventional radiology. To promote radiation safety by standardizing workflow and encouraging team responsibility, the campaign Website includes a procedural checklist that the medical team may use to review radiation safety steps before each pediatric interventional procedure.

CONCLUSION. Use of this checklist can be an effective tool in the ongoing effort to maximize radiation safety during interventional procedures.

HPA: Risk information for patients

X-rays

How safe are they?



Thirty years ago, X-rays were the only way to see what was going on inside your body. Now other methods of medical imaging are available, some using different types of radiation from X-rays. They are briefly described on the next two pages. Patients are sometimes concerned about the possible harmful effects of radiation, so this leaflet goes on to explain the risks and to put them into perspective.

Radiation risks for older and younger patients

As you get older you are more likely to need an X-ray examination. Fortunately radiation risks for older people are lower than those shown in the table on page 5. This is because there is less time for a radiation-induced cancer to develop, so the chances of it happening are greatly reduced.

Children, however, with most of their life still ahead of them, may be at twice the risk of middle-aged people from the same X-ray examination. This is why particular attention is paid to ensuring that there is a clear medical benefit for every child who is X-rayed. The radiation dose is also kept as low as possible without detracting from the information the examination can provide.

A baby in the womb may also be more sensitive to radiation than an adult, so we are particularly careful about X-rays during pregnancy. There is no problem with something like an X-ray of the hand or the chest because the radiation does not go anywhere near the baby. However, special precautions are required for examinations where the womb is in, or near, the beam of radiation, or for isotope scans where the radioactive material could reach the baby through the mother's circulating blood.

If you are about to have such an examination and are a woman of childbearing age, the radiographer or radiologist (see definitions on the last page) will ask you if there is any chance of your being pregnant.

If this is a possibility, your case will be discussed with the doctors looking after you to decide whether or not to recommend postponing the investigation. There will be occasions when diagnosing and treating your illness is essential for your health and your unborn child. When this health benefit clearly outweighs the small radiation risks, the X-ray or scan may go ahead after discussing all the options with you.

Radiation risks for future generations

If the reproductive organs (ovaries or testes) are exposed to radiation there is a possibility that hereditary diseases or abnormalities may be passed on to future generations. Although the effect has never been seen in humans, lead-rubber shields can be placed over the ovaries or testes during some X-ray examinations, as a precaution. They are only necessary for examinations of the lower abdomen and thighs on patients who are young enough to have children. Even then, there are some examinations where it is not practicable to use gonad shields since they will obscure important diagnostic information.

Are Professionals Sending the Right Message?

The New York Times http://nyti.ms/1hUyUlq

THE OPINION PAGES | OP-ED CONTRIBUTORS

We Are Giving Ourselves Cancer

By RITA F. REDBERG and REBECCA SMITH-BINDMAN JAN. 30, 2014

DESPITE great strides in prevention and treatment, cancer rates remain stubbornly high and may soon surpass heart disease as the leading cause of death in the United States. Increasingly, we and many other experts believe that an important culprit may be our own medical practices: We are silently irradiating ourselves to death.

Neither doctors nor patients want to return to the days before CT scans. But we need to find ways to use them without killing people in the process.

Other Projects Planned for 2014

- Study of Possible Alterations in the Dose Limits for the Lens of the Eye
- Evaluating and Communicating Radiation Risks for Studies Involving Human Subjects: Guidance for Researchers and Reviewing Bodies
- Improving Patient Dose Utilization in CT
- Policies for Managing High Dose Procedures and Deterministic Injuries Associated with Fluoroscopically Guided Interventions (FGI)

What does the future hold for the NCRP?

- While many advances have been made, there are still many questions of importance to radiation protection that have not been fully resolved

- NCRP will play an important role in helping to develop a consensus view regarding complex radiation protection issues well into the 21st Century.

- Reducing these uncertainties will continue to influence the cost and benefits derived from the ever expanding use of radiation in everything from medical imaging to homeland security.

What does the future hold for the NCRP?

- The unique and invaluable resource that is the NCRP is in large part due to the selfless dedication and numerous contributions of its Council and scientific committee members

- The multidisciplinary composition of these leading experts' and their collective input on complex questions provides a unique synergy that results in a comprehensive and well balanced approach to addressing radiation protection challenges today and in the future

What does the future hold for the NCRP?

- There will be a continuing need for the NCRP to identify the principles upon which radiation protection is based and to provide guidance on best practices for the many beneficial uses of radiation in society.

- Subsequent presentations covering a broad range of relevant topics will review sentinel accomplishments of the past as well as current work and future challenges that are in keeping with NCRP's mission to advance the science of radiation protection in the public interest.

Thank You For Your Attention