

# Overview of Japanese System

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# Regulatory infrastructure to control exposures in medical applications

Prime Minister's Cabinet Office

## Nuclear Safety Commission

### Radiation Council

To provide technical advise on radiological protection to relevant ministries

etc

### MHLW

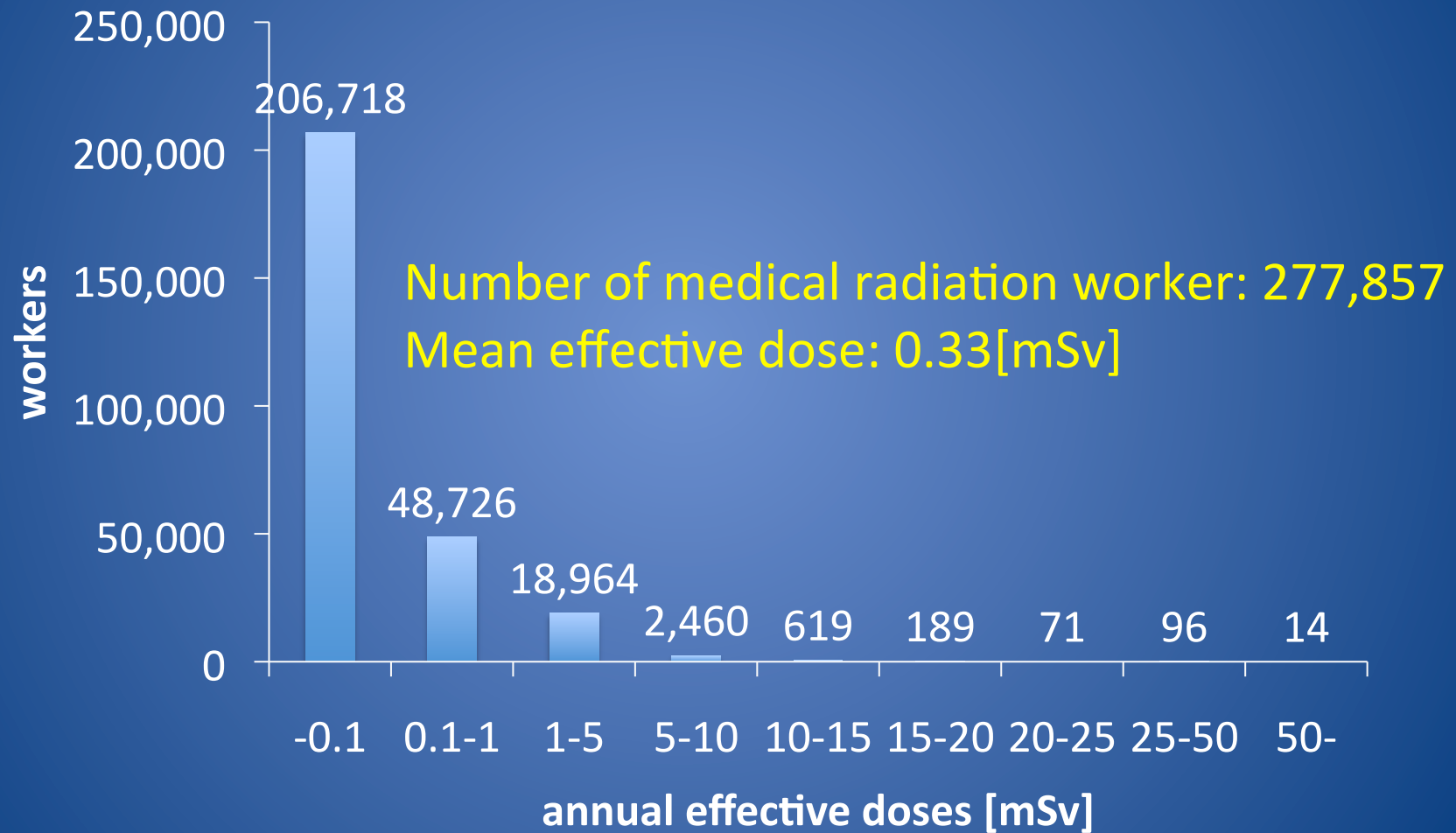
Medical use of radiation

*# Periodic inspection to hospitals by public health center*

Radiopharmaceuticals & Medical Devices

Radiation Protection for Labour

# Occupational exposure in the medical sector in Japan

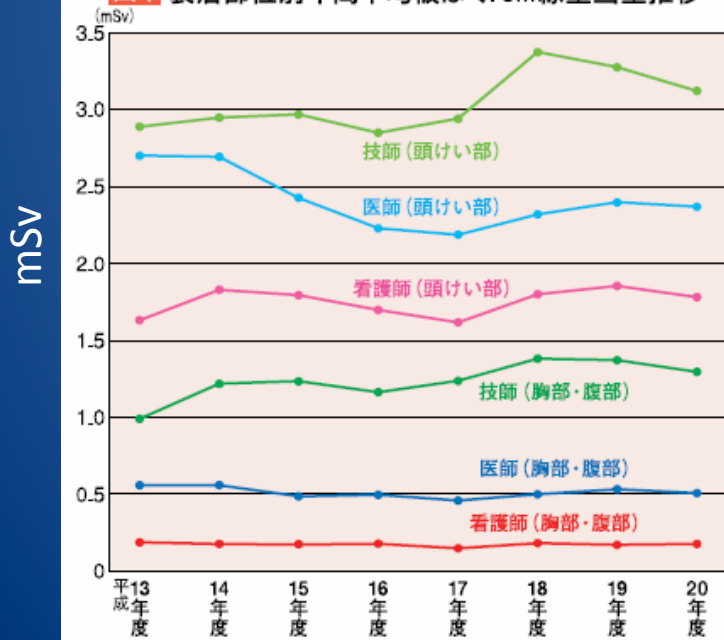


Japan Association on Personal Radiation Monitoring Companies, 2008  
<http://www.kosenkyo.jp/siryou/jikkou20.htm>

# Occupational exposure in the medical sector

	Physician	Technologist	Nurse	Other
number	56,810	25,370	40,677	22,747
Mean effective dose	0.29	0.84	0.15	0.11
Mean dose to lens	0.68	1.21	0.57	0.21
Mean dose to skin	1.00	1.44	0.65	0.33

図4 装着部位別年間平均被ばく1cm線量当量推移



<http://www.c-technol.co.jp/pdf/405FBN.pdf>, 2009

Technologist

Physician

Nurse

Technologist

Physician

Nurse

H(10) measured at neck

H(10) measured at chest or abdomen

from 2001-2008

[http://www.nagase-landauer.co.jp/quixel/tech\\_info/pdf/h20-1.pdf](http://www.nagase-landauer.co.jp/quixel/tech_info/pdf/h20-1.pdf)

# Number of overexposures

	2006	2007	2008
50mSv or over	10	12	14

Japan Association on Personal Radiation Monitoring Companies

- 2002.2-2003.4: Damaged lead apron caused 26.5mSv to a physician
- 2003.4-2004.3: Recorded dose for an physician was 53.9mSv/y
  - Interventional radiology
  - Guidelines for Radiation Safety in Interventional Cardiology(JCS2006)
- 2003.6: Recorded dose for an technologist was 120.8mSv/y
  - Lack of confirmation by the technologist and RSO
    - [http://kokai-gen.org/information/10\\_049-2.html](http://kokai-gen.org/information/10_049-2.html)
- 2007: Dose rate from lead apron was 0.4mSv/h as H(0.07)
  - The amount of Pb-210 was 6kBq per an apron that was imported from USA
    - [http://www.mext.go.jp/a\\_menu/anzenkakuho/news/trouble/1268624.htm](http://www.mext.go.jp/a_menu/anzenkakuho/news/trouble/1268624.htm)
    - [http://www.osha.gov/dts/hib/hib\\_data/hib19970624.html](http://www.osha.gov/dts/hib/hib_data/hib19970624.html)

# Quality of the individual monitoring

Submission

- Submission for a standard exposure from each monitoring company

Exposure

- Standard exposure to personal dosimeters at the institute of radiation measurements

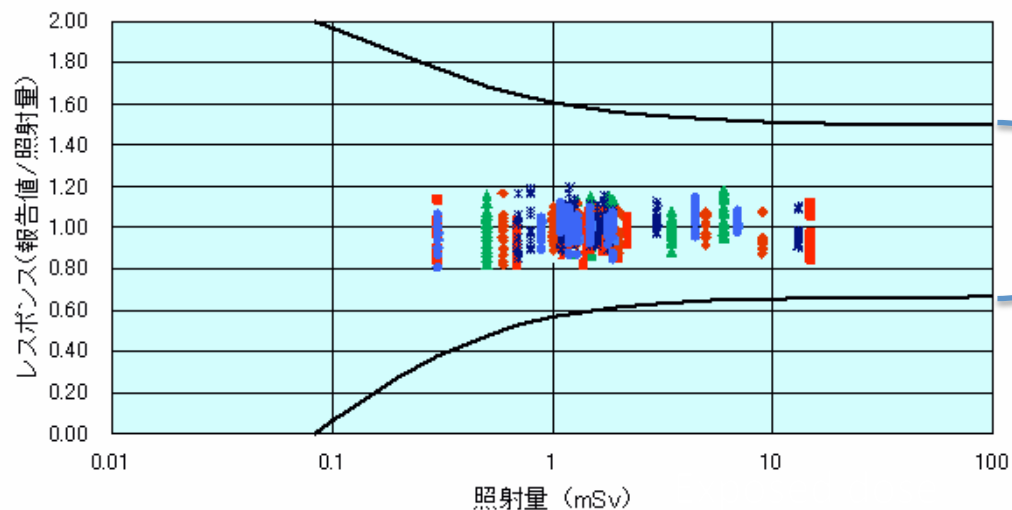
Measurement

- Measurement of exposed personal dosimeters by each monitoring company

Evaluation

- Evaluation by the institute of radiation measurements

Relative response  
(measured/standard)



Acceptable  
uncertainty

# Dose record keeping

- Licensee
  - has to keep dose records for 30 years
- Service Provider
  - keeps dose records eternally
- Central dose register
  - Radiation Effect Association is certified by MEXT

## Dose to finger (2008):

Number of monitored workers by Nagase Landauer: 3,088

mean 9.06mSv(+1.08mSv compared with 2007) for male, 2.90mSv(-0.23mSv) for female

Above 100mSv: 44(1.1%), Above 500mSv: 6

# Workplace monitoring

- Regulatory requirements
  - Once a month or twice a year for fixed source
- Degree to these requirements
  - 99.6%
    - <http://www.mhlw.go.jp/stf/houdou/2r985200000068ds-img/2r985200000068fa.pdf>
- Means to verify compliance
  - Inspection by public health center



# Qualified medical physicists

- 418 medical physicists, April 2009
- will be 1,000 in near future
- They are mainly working at radiation therapy
- Radiation protection is mainly managed by radiological technologists

# Implementation of the requirements

- Medical service Law
  - Safety standard for usage of medical radiation devices and radioactive sources
  - Notice-Board in radiation control area
  - Limitation of place for usage of medical radiation devices and radioactive sources
  - Radioactive waste control
  - Radiation monitoring
  - Radiation protection for workers
- Industrial Safety and Health Law
  - education

# How the Regulatory body ensures?

- Examination of safety evaluations submitted from hospitals
- On-the-spot inspection
  - Public health center
    - Medical service Law
  - Labor Standards Inspection Office
    - Industrial Safety and Health Law
  - MEXT for medical accelerator and sealed sources

# Challenging issues

- Development of medical radiation technology
  - Medical radiation devices & radiopharmaceuticals outside of radiation controlled area
    - Surgical operation room, ICU, NICU, VAIVT, I-131 ablation
  - Newly developed devices & radiopharmaceuticals
    - Sr-89, Y-90
- Public exposure to workers relating medical radiation
  - Hotel, taxi, recycling facility, sewerage plant, etc
  - Risk communication

# Summary

- Central dose register
  - Science council of Japan have recommended to establish the central dose register system including medical radiation workers in July 2010
    - Facilitate consensus building among stakeholders
- Need for radiation protection corresponding to the development of medical radiation technology
  - Promote radiation safety culture in health care