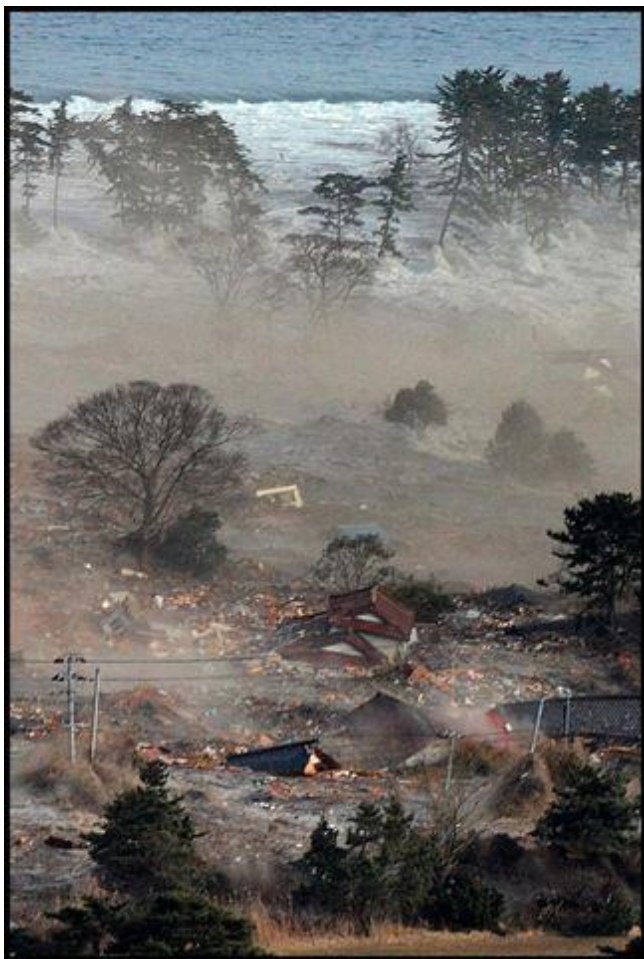


Status of Medical Physicists in Japan

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Tohoku University is located
In Miyagi prefecture.
Miyagi prefecture was also
attacked by the Tsunami at March
11th, 2011.
Matsushima was safe by the
defense of many small islands.

History of a medical physicist

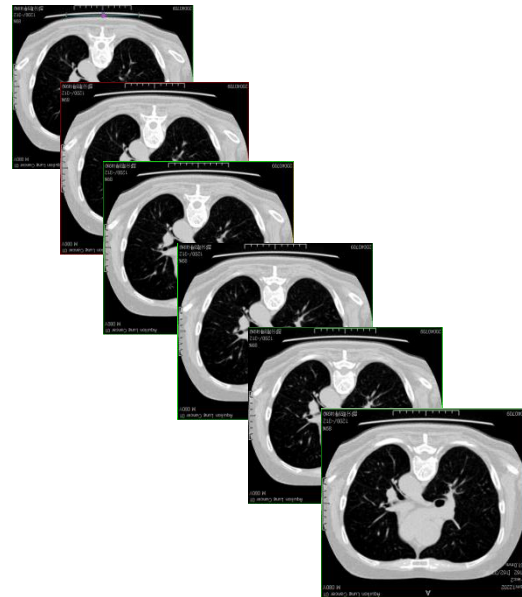
1895.11.8 W. C. Roentgen discovered X-ray



X-ray was rapidly used in medicine by its permeability.

History of a medical physicist

Physicists contributed to the development of medical equipment using X-ray.



History of a medical physicist

- 1943 Hospital Physicists' Association was established (England).
- 1950' A medical physics master's course was established (USA).
- 1958 American Association of Physics in Medicine was established.
- 1960 International Organization for Medical Physics was established.
- 1965 The first meeting of International Congress on Medical Physics was opened (Harrogate, England).

Today, there are more than 5,000 medical physicists in USA.

Number of physicists working in medical establishments (WHO 1972)

Country	Number of Physicists	Number per million population	Year of estimate
Argentina	8	0.34	1972
Belgium	8	0.8	1972
Canada	50	2.27	1972
Egypt	34	0.69	1972
Fed. Republic of Germany	120–150	2.25	1972
France	45	0.9	1972
Greece	22	2.5	1972
India	70	0.14	1971
Israel	6	2	1972
Nigeria	1	0.02	1972
Norway	14	3.68	1972
Philippines	4	0.11	1972
Poland	45–50	1.44	1972
Spain	20	0.61	1972
Sweden	40	5	1971
Switzerland	12–14	2.17	1972
Thailand	11	0.34	1972
United Kingdom	550	11	1971
USA	800	3.81	1972

What is a medical physicist?

Medical physicists contribute to the effectiveness of radiological imaging procedures by assuring radiation safety and helping to develop improved imaging techniques (e.g., mammography CT, MR, ultrasound). They contribute to development of therapeutic techniques (e.g., prostate implants, stereotactic radiosurgery), collaborate with radiation oncologists to design treatment plans, and monitor equipment and procedures to ensure that cancer patients receive the prescribed dose of radiation to the correct location.

By The American Association of Physicists in Medicine

History of a medical physicist in Japan

Japan Radiology Society (JRS) started recognition of medical physicists in 1987. Qualifications of candidacy for the examination were science and technology course graduate of a university and a member of JRS.

70 medical physicists were approved by the first examination.

Number of medical physicists in Japan did not increase for a long time, and the number was only 121 in 2000.

And there was no medical physicist in hospitals.

Main reason was that the certification of a medical physicist is not a national license and a medical physicist without any national license is hard to get a job as a medical staff at a hospital in Japan.

History of a medical physicist in Japan

However, highly advanced radiation therapy and radiation diagnoses has been performed by the support of medical radiology technicians in Japan. These technicians could not be medical physicists because of their academic backgrounds.

It was discussed in JRS board meeting that excellent medical radiology technicians should be medical physicists.

History of a medical physicist in Japan

- 2002 JRS permitted qualifications of candidacy for the examination to medical radiology technicians.
- 2009 Organization of recognition of medical physicists was transferred from JRS to Japanese Board for Medical Physicist Qualification (JBMP).

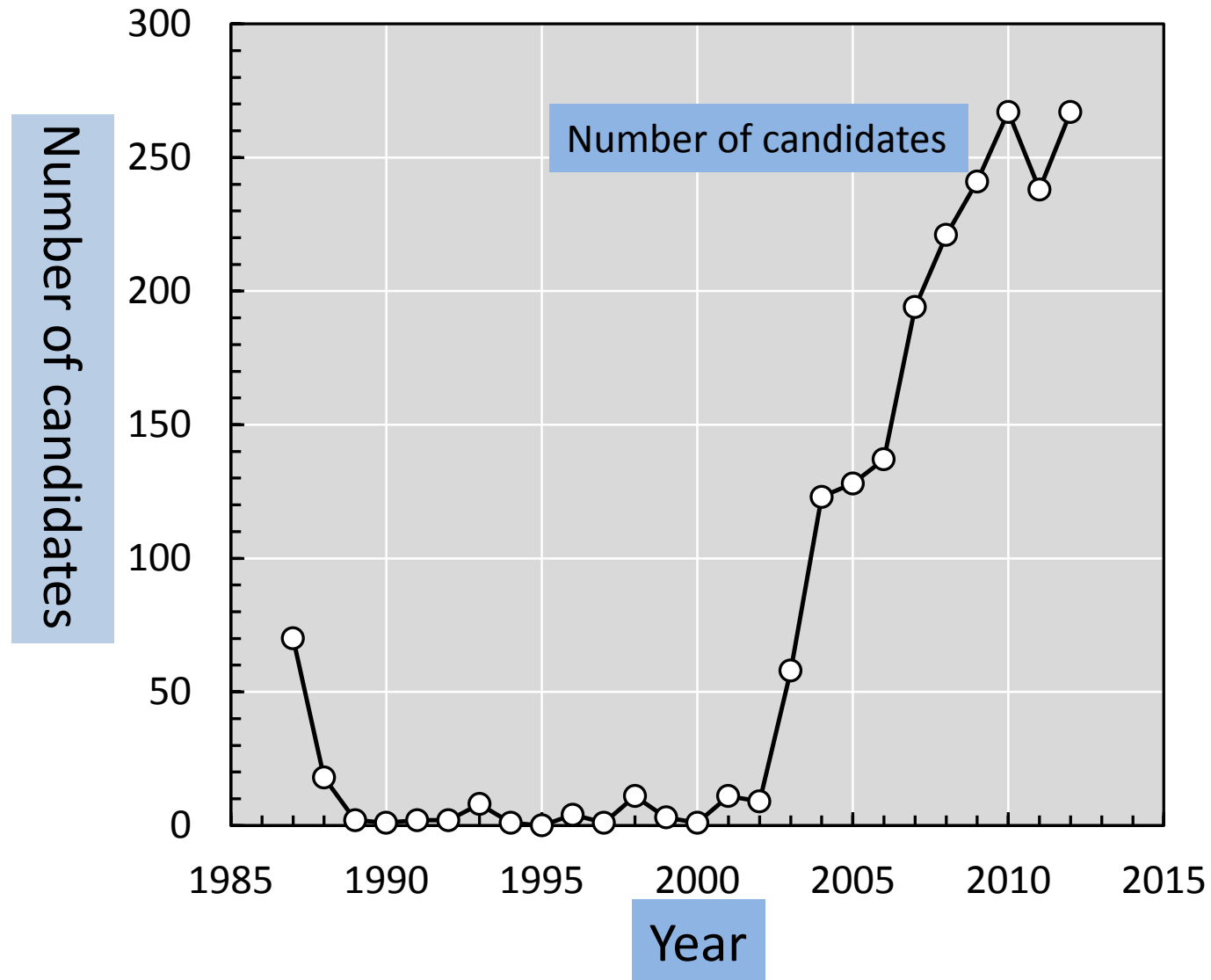
Many radiation treatment accidents

Hospital	Date	Causes	Victims	Dose
1 . T hospital	April, 2001	Wrong input of wedge coefficient	23	over
2 . K University hospital	July, 2002	Wrong input of wedge coefficient	12	over
3 . National H hospital	Oct. 2003	Wrong estimation of dose	276	over
4 .Y University hospital	Feb. 2004	Wrong input of field coefficient	63	under
5 . Y city hospital	March, 2004	Wrong management of planning system	25	over
6 . T hospital	April, 2004	Wrong use of dosimeter	256	under
7 .W University hospital	May, 2004	Wrong input of wedge coefficient	1	over
8 .I University hospital	May, 2004	Wrong input of wedge coefficient	111	under
9 .N University hospital	Feb. 2007	Wrong management of planning system	7	over

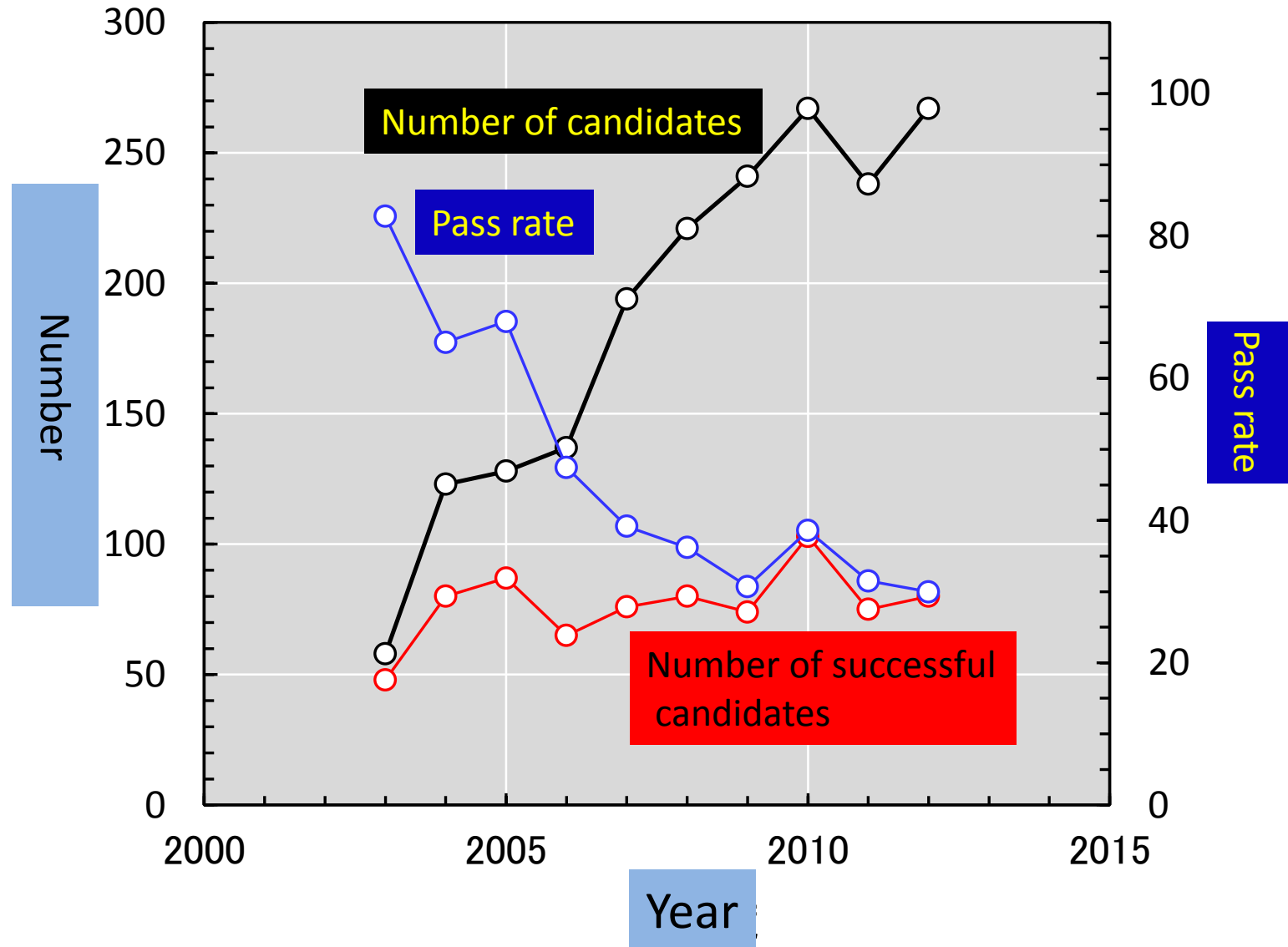
History of a medical physicist in Japan

Medical physicists were needed as a specialist for many radiation treatment accidents and delay of development of medical radiological equipment and therapeutic and imaging techniques.

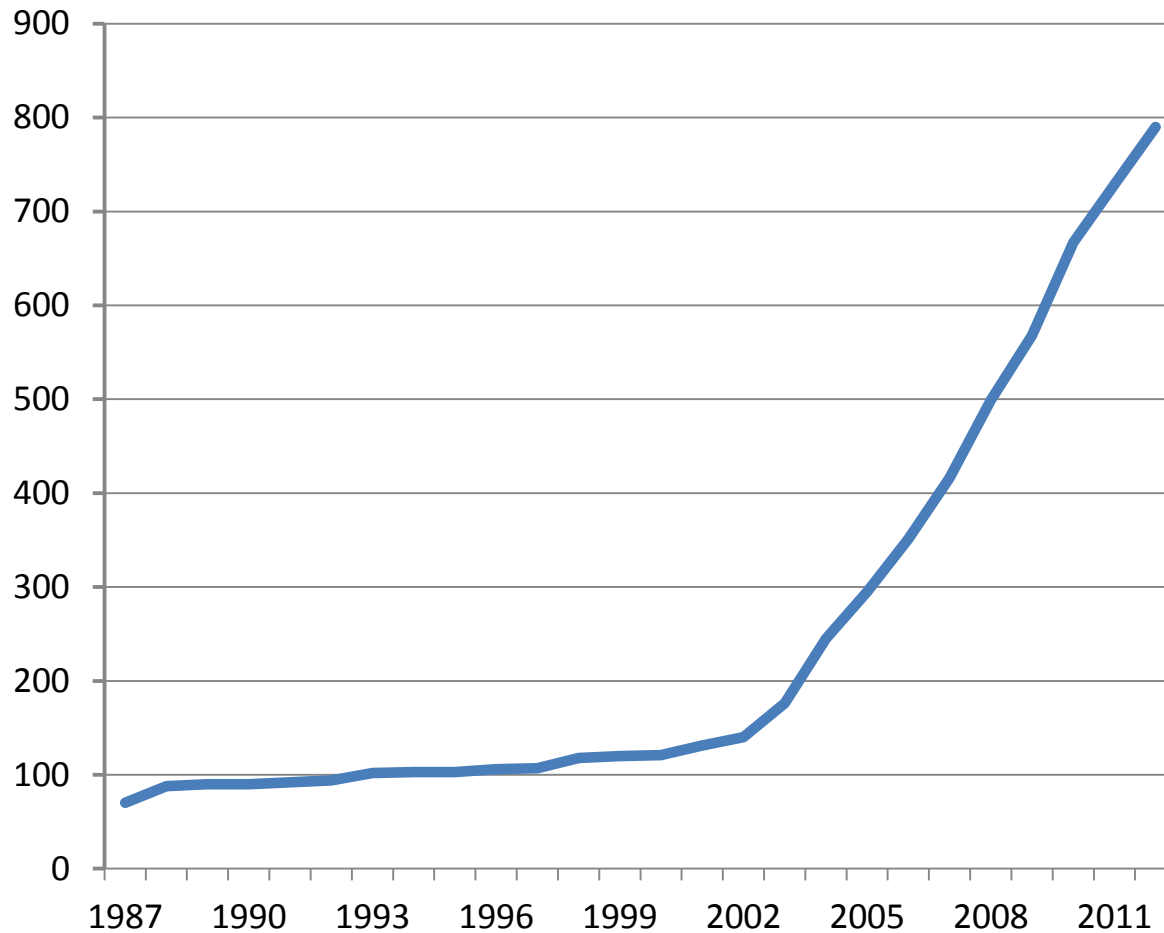
Number of candidates for an examination of a medical physicist in Japan



Pass rate of the examination



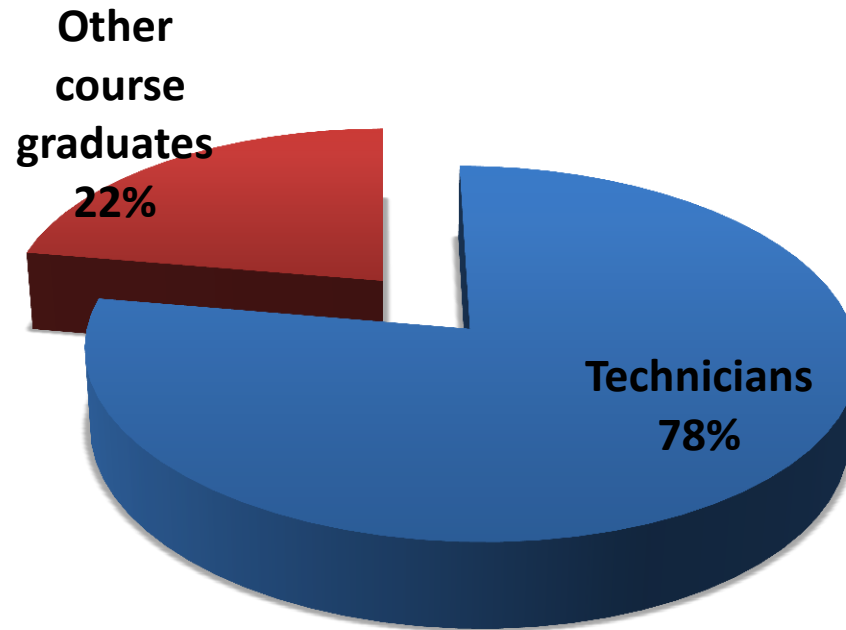
Number of medical physicists in Japan



Today, there are about 800 medical physicists in Japan.

Problems of medical physicists in Japan

1. The majority of medical physicists in Japan are medical radiology technicians.

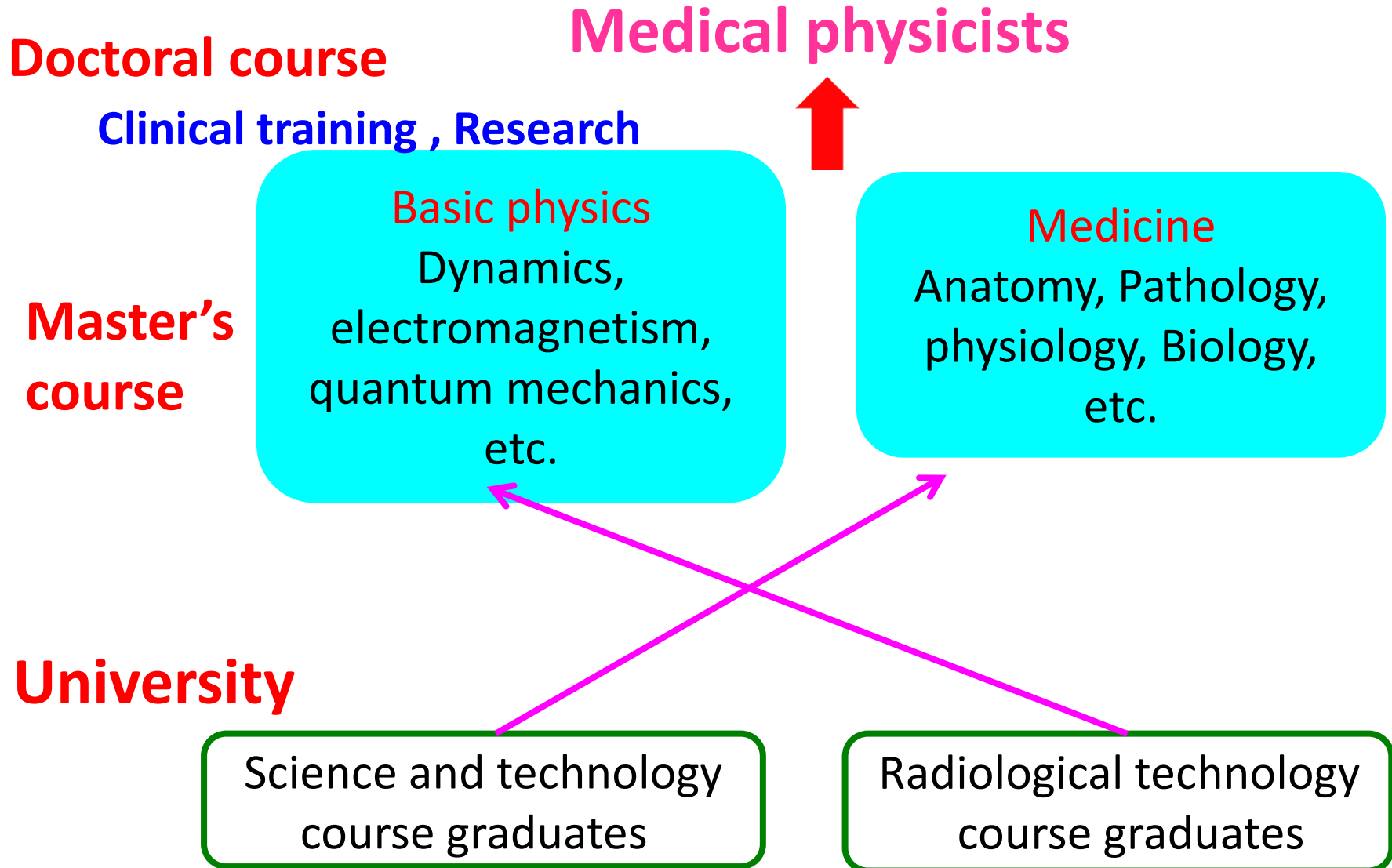


Problems of a medical physicist in Japan

However, the examination pass rate is only 30 % and many junior colleges, which bring up medical radiology technicians, became universities with doctor's course. And 18 universities made a special doctoral course for medical physicists, in which students learn both physics and medicine.

Today, qualifications of candidates for a medical physicist examination are master's course graduates.

Recommended course for medical physicists by JBMP



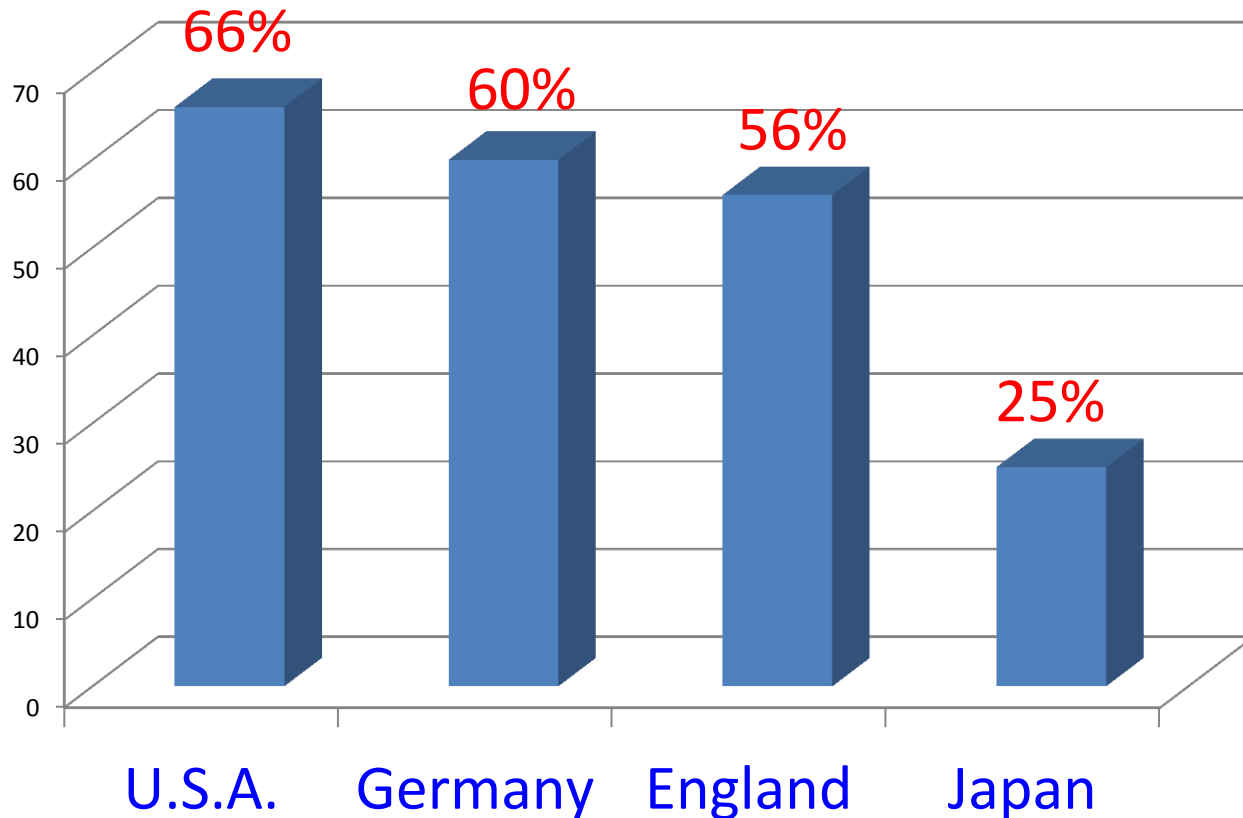
Problems of a medical physicist in Japan

2. The certification of a medical physicist is not a national license.

A medical physicist graduated from science and technology course is hard to get a job in a hospital.

On the other hand, a medical physicist with a national license of medical radiology technician is hard to work exclusively as a medical physicist.

The ratio of radiotherapy in cancer treatment



And number of cancer patients is rapidly increasing in Japan !

Cancer control act

Our Government decided cancer control act in 2006.

It's written that radiation therapy, chemotherapy, and palliative care are extremely poor in Japan as compared with western countries' cancer therapy and specialists of these treatment should be brought up.

Ministry's reaction by the cancer control act

1. Training program for medical physicists is promoted from the support of Ministry of Education, Culture, Sports, Science and Technology.
2. Hospitals possessing highly advanced radiotherapy system can get higher medical fee from the health insurance due to the employment of medical physicists by the support of Ministry of Health, Labour and Welfare . And these hospitals are possible to employ 3~5 medical physicists.

However, number of
medical physicists in general
hospitals has not been
increased!

A medical physicist without any national license cannot be a medical staff especially of a public hospital. He can get a job only as a researcher or a teacher.

On the other hand, a technician with the certification of a medical physicist is working both as a technician and a medical physicist in many hospitals.

The certification of a medical physicist should be changed to some national license like other countries and a medical physicist should work as a full time specialist!

At the time of Fukushima disaster.



Onagawa nuclear power plant in Miyagi prefecture was safe, because it was founded 14.6 m above sea level.

Our theme including medical physicists a decontamination of the refugee from Fukushima.

Some medical physicists gave advice for people by telephone at the prefectural office. Some medical physicists of National Institute of Radiological Sciences made a calculation of people's radiation dose.

However, number of medical physicists in Japan was too small to take a leading part at the Fukushima disaster.



We have about 2,000 medical physicists 10 years later. However, number of jobs will be not enough.

Of course, Japanese medical physicists will do their best in the field of public radiation safety. And JBMP promotes education and training for radiation safety.

Conclusion

- The majority of Japanese medical physicists are technicians. However, they are now highly educated.
- Number of Japanese medical physicists is too small to act as a specialist of public radiation safety.
- We need your help for the certification of a medical physicist to be some national license.