Table 4. Structure and personnel by Patterns of Care Study institutional stratification

	Structure and personnel					
	A1 (n = 71)	A2 (n = 71)	B1 (n = 288)	B2 (n = 291)	Total (n = 721)	Comparison with data of 2005* (%)
Institutions/total institutions (%)	9.8	9.8	39.9	40.4	100	—
Institutions with RT bed (n)	59 (83.1)	35 (49.3)	120 (41.2)	67 (23.3)	281 (39.0)	−2.1 (−1.3†)
Average RT beds/ institution (n)	12.9	3.2	2.8	1.0	3.1	−13.9
No. of ROs (full time + part time)	350 + 47	142 + 35	336 + 188	179 + 264	1007 + 534	6.1
JASTRO*-certified ROs* (full time)	198	64	169	46	477	12.0
Average JASTRO-certified ROs/institution	2.8	0.9	0.6	0.2	0.7	16.7
Total (full time and part time) RO FTE*	301.9	100.2	287.8	136.4	826.3	6.7
Average FTE ROs/ institution	4.3	1.4	1.0	0.5	1.1	0.9
Patient load/FTE RO	200.1	218.2	327.3	209.9	248.2	0.6
No. of RT technologists (full time + part time)	471 + 24	267 + 7	1046 + 31	833 + 3	2617 + 65	—
Total (full time and part time) RT* technologists FTE	375.8	178.7	648.9	430.7	1634.1	—
Average FTE RT technologists/institution	5.3	2.5	2.3	1.5	2.3	—
Patient load/FTE RT technologist	160.7	122.4	145.2	66.5	125.5	—
No. of nurses (full time + part time)	162 + 16	129 + 11	454 + 72	319 + 38	1064 + 137	68.9
Total (full time and part time) nurses FTE	118.5	57.7	220.9	97.3	494.4	—
No. of medical physicists (full time + part time)	80 + 2	37 + 2	104 + 6	47 + 1	268 + 11	129.1
Total (full time and part time) medical physicists FTE	26.2	6.3	27.4	8.5	68.4	—
No. of RT QA staff (full time + part time)	132 + 1	70 + 2	222 + 5	104 + 0	528 + 8	105.6
Total (full time and part time) RT QA staff FTE	31.5	12.1	46.4	16.6	106.6	—

Abbreviations: A1 = university hospitals/cancer centers treating 440 patients or more per year; A2 = university hospitals/cancer centers treating 439 patients or fewer per year; B1 = other national/public hospitals treating 140 patients or more per year; B2 = other national hospital/public hospitals treating 139 patients or fewer per year; RT = radiotherapy; RO = radiation oncologist; JASTRO = Japanese Society of Therapeutic Radiology and Oncology; FTE = full-time equivalent (40 hours/week only for RT practice); QA = quality assurance.

Data in parentheses are percentages. "Full time or part time" means only the style of employment at each institution. However, FTE data were surveyed depending on clinical working hours for RT of each person. This is a measure to represent actual personnel at each institution.

* Rate of increase compared with data of 2005. The calculating formula was as follows: $\frac{data\ of\ 2007\ (n) - data\ of\ 2005\ (n)}{data\ of\ 2005\ (n)} \times 100\ (\%)$.

† Comparison with data of 2005. The calculating formula was as follows: Data of 2007 (%) − Data of 2005 (%).

United States. However, the numbers of patients in Japan increased significantly during the next 17 years by a factor of 2.8 compared with the number in 1990 (3). However, the utilization rate of radiation for new cancer patients remained at 26.1%, less than half that recorded in the United States and European countries, although the rate increased slightly, by 0.8% per year between 2005 (5) and 2007. For the implementation of the anticancer law, comparative data of the structure of radiation oncology in Japan and in the United States, as well as relevant PCS data, proved to be very helpful.

Compared with 1990, the number of linac systems increased significantly by a factor of 2.45 and grew by 5.5% over 2005 (5) whereas the percentage of systems using telecobalt decreased to only 15. Furthermore, the various functions of linac, such as dual energy, 3D CRT (multileaf collimator width <1 cm), and IMRT, improved significantly. The number of high dose rate (HDR) RALSs in use has increased by 1.4 times, and ^{60}Co RALSs have been largely replaced by ^{192}Ir RALSs. In 2007 CT simulators were installed in 65.6% of institutions throughout the country for

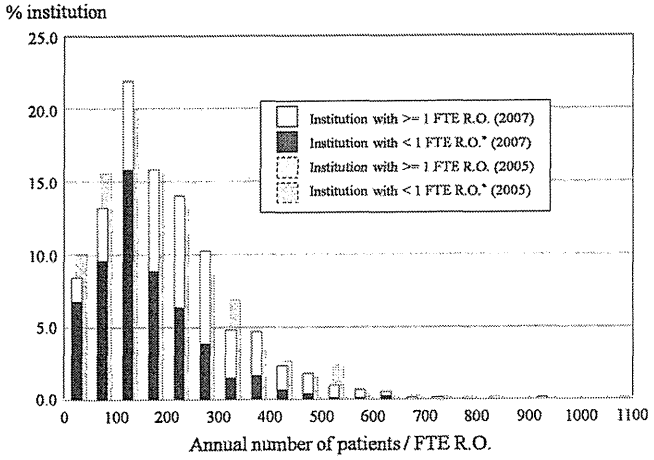

Fig. 1. Percentage of institutions by patient load per full-time equivalent (FTE) staff of radiation oncologists (RO) in Japan. White bars or gray bars represent institutions with 1 or more FTE staff, and blue bars or aqua bars represent institutions with fewer than 1 FTE RO*. Spacing of the bars represents intervals of 50 patients per FTE RO. Asterisk, The number of FTEs for institutions with FTE fewer than 1 was calculated as FTE equal to 1 to avoid overestimating patient load per FTE RO.

a 10.3% increase over 2005 (5) and exceeded the percentage of X-ray simulators (60.9%). Radiotherapy planning systems were used in 95.3% of institutions, for an increase in the number of radiotherapy planning systems of 5.54 times compared with 1990 (3). Maturity of the functions of linac and possession rates of CT simulators and systems using ^{192} Ir RALS also improved further compared with 2005 (5) but still closely correlated with the PCS institutional stratification, which could therefore aid in the accurate discrimination of structural maturity and immaturity and the identification of structural targets for improvement.

The staffing patterns in Japan also improved in terms of numbers. However, institutions with fewer than 1 FTE RO

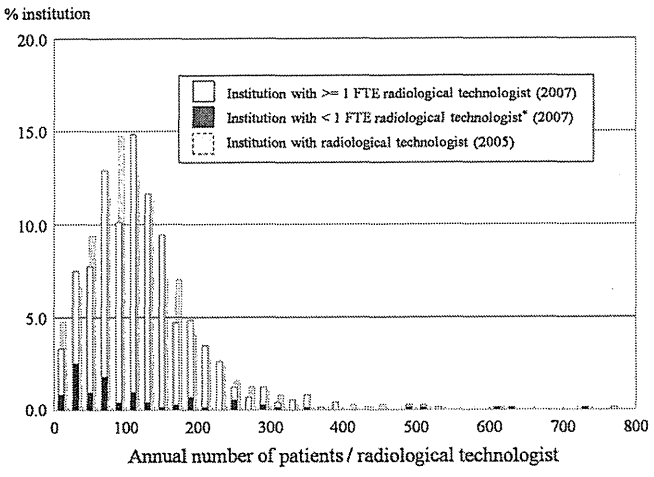

Fig. 2. Percentage of institutions by patient load per full-time equivalent (FTE) radiotherapy technologist in Japan. Spacing of the bars represents intervals of 20 patients per FTE staff. Asterisk, The number of FTEs for institutions with FTE fewer than 1 was calculated as FTE equal to 1 to avoid overestimating patient load per FTE radiotherapy technologist.

on their staff still account for 56% nationwide, representing a 4% decrease compared with 2005 data (5). Therefore more than half the institutions in Japan still rely on part-time ROs. There are two reasons for this. First, the number of cancer patients who require radiation is increasing more rapidly, by 7.3% in the last 2 years, than the number of FTE ROs, which grew by 6.7% during the same period. Second, specialist fees for ROs in academic institutions are not recognized by the Japanese medical care insurance system, which is strictly controlled by the government. Therefore most ROs or other oncologists at academic institutions must work part time at affiliated hospitals in the B1 and B2 groups to earn a living. To reduce the number of institutions that rely on part-time ROs and thus may encounter problems with their quality of care, a reform of Japan's current medical care system, especially as it applies to staff at academic institutions, is required based on treatment outcome. However, great care is needed to ensure that the long-term success of radiation oncology in Japan and patient benefits are well balanced with costs. Therefore personal identification of ROs in all four types of institutions (A1, A2, B1, and B2) was recorded in this survey for further detailed analysis of patient load and real cost. Even under current conditions, however, the number of FTE ROs increased by 2.26 times compared with 1990 (3), with a 6.7% increase over 2005 (5). On the other hand, patient load per FTE RO also increased by 1.44 times to 248.2 during the same period, that is, a 0.6% increase over 2005 (5). This may reflect the growing popularity of RT because of an increase in the elderly population and recent advances in technology and improvement in clinical results. The caseload ratio in Japan has already exceeded the limit of the Blue Book guidelines of 200 patients per RO and has been getting worse (19, 20). The percentage distribution of institutions by patient load per RO showed a smaller distribution than that in the United States in 1989 (3) but also showed a major shift to a larger size in 2007 compared with 1990 (3). Therefore Japanese radiation oncology seems to be catching up quickly with the Western system despite limited resources. Furthermore, additional recruiting and education of ROs are still top priorities for JASTRO.

The distribution of patient load per RT technologist shows that only 14.7% of institutions met the narrow guideline range (100–120 per RT technologist) and the rest were densely distributed around the peak level. Compared with the distribution in the United States in 1989, nearly 18% of institutions in Japan had a relatively low caseload of 10 to 60, because there are still a large number of smaller B2-type institutions, which account for nearly 40% of institutions that do not attain the range specified by the guidelines. As for medical physicists, a similar analysis for patient load per FTE staff remains difficult, because their number was very small and they were working mainly in metropolitan areas. In Japan, however, RT technologists have been acting partly as medical physicists. Their education has been changed from 3 to 4 years during the last decade, and graduate and postgraduate courses have been introduced. Currently, those who have obtained a master's degree or RT

Table 5. Primary sites of cancer treatment with radiotherapy in 2005 by Patterns of Care Study institutional stratification for new patients

Primary site	A1 (n = 71)		Comparison with data of 2005* (%)	A2 (n = 70)		Comparison with data of 2005* (%)	B1 (n = 282)		Comparison with data of 2005* (%)	B2 (n = 283)		Comparison with data of 2005* (%)	Total (n = 706)		Comparison with data of 2005* (%)
	n	%		n	%		n	%		n	%		n	%	
Cerebrospinal	2,021	4.1	−22.4	720	4.1	−6.5	5,569	7.2	25.7	1,396	5.9	75.6	9,706	5.8	12.9
Head and neck (including thyroid)	6,522	13.1	3.2	2,124	12.0	−10.5	6,262	8.1	3.8	1,655	6.9	0.3	16,563	9.8	1.2
Esophagus	3,448	6.9	9.0	1,179	6.7	0.7	4,068	5.3	−8.1	1,474	6.2	1.5	10,169	6.0	−0.4
Lung, trachea, and mediastinum	7,460	15.0	5.5	2,852	16.1	8.1	16,811	21.7	12.5	5,844	24.5	8.5	32,967	19.5	9.7
Lung	6,794	13.6	24.2	2,452	13.9	7.9	14,546	18.8	12.6	5,393	22.6	13.9	29,185	17.3	14.9
Breast	10,336	20.8	15.6	3,663	20.7	20.1	17,334	22.4	22.5	5,011	21.0	21.7	36,344	21.5	20.1
Liver, biliary tract, and pancreas	1,929	3.9	−0.4	674	3.8	−5.5	2,806	3.6	2.3	1,023	4.3	6.1	6,432	3.8	1.2
Gastric, small intestine, and colorectal	2,075	4.2	9.4	1,015	5.7	25.9	4,034	5.2	7.8	1,498	6.3	7.1	8,622	5.1	9.9
Gynecologic	3,315	6.7	1.9	1,058	6.0	−8.5	3,059	4.0	−10.2	781	3.3	−8.7	8,213	4.9	−5.3
Urogenital	6,772	13.6	22.2	2,498	14.1	22.3	9,750	12.6	20.8	2,993	12.6	3.0	22,013	13.0	18.6
Prostate	5,394	10.8	25.7	1,748	9.9	26.2	7,015	9.1	24.7	2,068	8.7	7.9	16,225	9.6	22.7
Hematopoietic and lymphatic	2,591	5.2	5.3	900	5.1	−14.4	3,631	4.7	0.2	935	3.9	3.4	8,057	4.8	0.2
Skin, bone, and soft tissue	1,456	2.9	−9.4	484	2.7	−35.4	1,879	2.4	2.7	751	3.2	−26.2	4,570	2.7	−12.2
Other (malignant)	894	1.8	26.8	237	1.3	0.9	897	1.2	9.1	292	1.2	−6.7	2,320	1.4	11.8
Benign tumors	988	2.0	48.8	266	1.5	−0.7	1,288	1.7	−0.1	186	0.8	37.8	2,728	1.6	15.8
Pediatric <15 y (included in totals kiabove)	440	0.9	1.1	116	0.7	−5.7	374	0.5	100.0	126	0.5	−58.3	1,056	0.6	0.9
Total	49,807	100	7.9	17,670	100	3.8	77,388	100	11.3	23,839	100	8.9	168.704†	100	9.1

Abbreviations: A1 = university hospitals/cancer centers treating 440 patients or more per year; A2 = university hospitals/cancer centers treating 439 patients or fewer per year; B1 = other national/public hospitals treating 140 patients or more per year; B2 = other national hospital/public hospitals treating 139 patients or fewer per year.

* Rate of increase compared with data of 2005. The calculating formula was as follows: $\frac{data\ of\ 2007\ (n) - data\ of\ 2005\ (n)}{data\ of\ 2005\ (n)} \times 100\ (\%)$.

† The total number of new patients was different with these data because no data on primary sites were reported by some institutions.

Table 6. Distribution of specific treatments and numbers of patients treated with these modalities by Patterns of Care Study stratification of institutions

Specific therapy	A1 (n = 71)		A2 (n = 71)		B1 (n = 288)		B2 (n = 291)		Total (n = 721)		Comparison with data of 2005* (%)
	n	%	n	%	n	%	n	%	n	%	
Intracavitary RT											
Treatment facilities	65	91.5	32	45.1	70	24.3	5	1.7	172	23.9	
Cases	1,795		497		925		18		3,235		−0.3
Interstitial RT											
Treatment facilities	51	71.8	19	26.8	22	7.6	5	1.7	97	13.5	
Cases	1,968		392		895		46		3,301		19.0
Radioactive iodine therapy for prostate											
Treatment facilities	43	60.6	12	16.9	22	7.6	1	0.3	78	10.8	
Cases	1,613		311		759		7		2,690		52.4
Total body RT											
Treatment facilities	64	90.1	34	47.9	68	23.6	19	6.5	185	25.7	
Cases	701		185		688		133		1,707		−1.8
Intraoperative RT											
Treatment facilities	15	21.1	9	12.7	10	3.5	7	2.4	41	5.7	
Cases	92		39		105		15		251		−35.1
Stereotactic brain RT											
Treatment facilities	40	56.3	24	33.8	92	31.9	30	10.3	186	25.8	
Cases	1,920		433		8,805		1,396		12,554		12.9
Stereotactic body RT											
Treatment facilities	43	60.6	14	19.7	54	18.8	12	4.1	123	17.1	
Cases	878		204		1,189		219		2,490		50.2
IMRT											
Treatment facilities	25	35.2	4	5.6	25	8.7	4	1.4	58	8.0	
Cases	1,142		38		1,534		85		2,799		270.7
Thermoradiotherapy											
Treatment facilities	8	11.3	5	7.0	8	2.8	2	0.7	23	3.2	
Cases	233		34		69		4		340		−41.5

Abbreviations: A1 = university hospitals/cancer centers treating 440 patients or more per year; A2 = university hospitals/cancer centers treating 439 patients or fewer per year; B1 = other national/public hospitals treating 140 patients or more per year; B2 = other national hospital/public hospitals treating 139 patients or fewer per year; RT = radiotherapy; IMRT = intensity-modulated radiotherapy.

* Rate of increase compared with data of 2005. The calculating formula was as follows: $\frac{data\ of\ 2007\ (n) - data\ of\ 2005\ (n)}{data\ of\ 2005\ (n)} \times 100\ (\%)$.

technologists with enough clinical experience can take the examination for qualification as a medical physicist, as can those with a master's degree in science or engineering, like those in the United States or Europe. In Japan a unique, hybrid-like education system for medical physicists has been developed since the anticancer law actively started to support improvement in QA/quality control specialization for RT. However, the validity of this education and training system remains to be proven, not only for QA/quality control but also for unique research and developmental activities. The discrepancy between FTE medical physicists and the number of registered medical physicists in Japan reflects the fact that their role in the clinic is not recognized as a full-time position only for medical physics service.

The distribution of the primary site for RT showed that more lung cancer patients were treated in B1- or B2-type non-academic institutions whereas more head-and-neck cancer patients were treated in A1- or A2-type academic institutions.

Table 7. Brain metastasis or bone metastasis patients treated with radiotherapy in 2005 by Patterns of Care Study institutional stratification

Metastasis	No. of patients										
	A1 (n = 71)		A2 (n = 71)		B1 (n = 288)		B2 (n = 291)		Total (n = 721)		Comparison with data of 2005* (%)
	n	%	n	%	n	%	n	%	n	%	
Brain	3,761	6.2	1,402	6.4	13,097	13.9	2,977	10.4	21,237	10.4	38.6
Bone	6,893	11.4	2,761	12.6	13,332	14.2	4,984	17.4	27,970	13.6	1.8

Abbreviations: A1 = university hospitals/cancer centers treating 440 patients or more per year; A2 = university hospitals/cancer centers treating 439 patients or fewer per year; B1 = other national/public hospitals treating 140 patients or more per year; B2 = other national hospital/public hospitals treating 139 patients or fewer per year.

* Rate of increase compared with data of 2005. The calculating formula was as follows: $\frac{data\ of\ 2007\ (n) - data\ of\ 2005\ (n)}{data\ of\ 2005\ (n)} \times 100\ (\%)$.

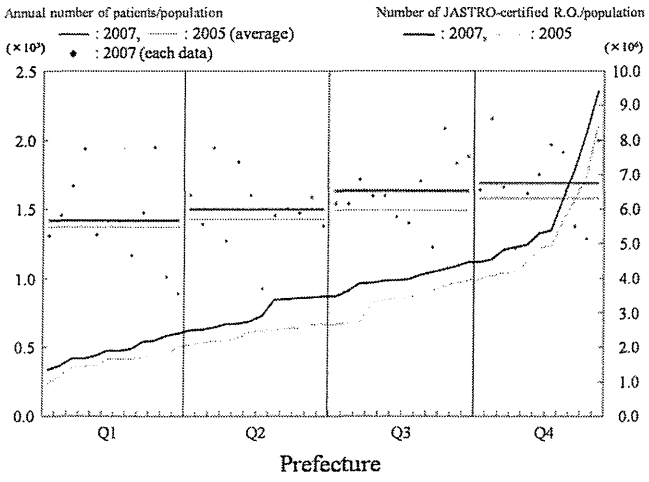

Fig. 3. Geographic distribution for 47 prefectures of annual numbers of patients (new plus repeat) per 1,000 population arranged in order of increasing number of Japanese Society of Therapeutic Radiology and Oncology (JASTRO)–certified radiation oncologists (ROs)/1,000,000 population by prefecture: Q1, 0–25%; Q2, 26–50%; Q3, 51–75%; and Q4, 76–100%. Horizontal lines show average annual number of patients (new plus repeat) per 1,000 prefectural population per quarter.

These findings may reflect the fact that more curative patients are referred to academic institutions and more palliative patients with lung cancer are treated at nonacademic institutions in Japan. However, the increase in the number of lung cancer patients in A1 institutions and that in prostate cancer patients in A1-, A2-, and B1-type institutions in 2007 were noteworthy. This suggests that the use of stereotactic body RT for lung cancer in A1 and of 3D CRT for prostate cancer in A1, A2, and B1 increased in 2007. The number of patients with brain metastasis increased significantly by 38.6% over 2005. This may also reflect dissemination of stereotactic RT for brain metastasis. The use of specific treatments and the number of patients treated with these modalities were significantly affected by institutional stratification, with more specific treatments being performed at academic institutions. These findings indicate that significant differences in patterns of care, as reflected in structure, process, and possibly outcome for cancer patients, continued to be prevalent in Japan in 2007. These differences point to opportunities for improvement. The Japanese PCS group published structural guidelines based on PCS data (20), and we are using the structural data obtained in 2007 to revise the Japanese structural guidelines for radiation oncology. The use of intraoperative RT and thermoradiotherapy decreased significantly, so these two modalities may not be considered as mainstay treatments anymore in Japan.

Geographic patterns showed that there were significant differences among prefectures in the use of RT, and the number of JASTRO-certified physicians per population was associated with the utilization of RT in both 2005 (5) and 2007, so a shortage of ROs or medical physicists on a regional basis will remain a major concern in Japan. However, the overall utilization rate of radiation in 2007 improved further compared with 2005 (5). The Japanese Society of Therapeutic Radiology and Oncology has been making every effort to recruit and educate ROs and medical physicists through public relations, to establish and conduct training courses at academic institutions, to become involved in the national examination for physicians, and to seek an increase in the reimbursement by the government-controlled insurance scheme and other actions.

In conclusion, the Japanese structure of radiation oncology has clearly and steadily improved over the past 17 years in terms of installation and use of equipment and its functions, although a shortage of personnel and differences in maturity by type of institution and by caseload still remain. Structural immaturity is an immediate target for improvement, whereas for improvements in process and outcome, the PCS and National Cancer Database, which are currently operational and the subject of close examination, can be expected to play an important role in the near future in Japan.

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SPECIAL ARTICLE

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Comprehensive Registry of Esophageal Cancer in Japan, 2002

Preface

We are very pleased to publish the Comprehensive Registry of Esophageal Cancer in Japan, 2002, we thank all the members of the Japan Esophageal Society who made great contributions in preparing this material.

First of all, we describe the history of the registry of esophageal cancer cases in Japan. The Registration Committee for Esophageal Cancer of the Japan Esophageal Society, has registered cases of esophageal cancer since 1976 and published the first issue of the Comprehensive Registry of Esophageal Cancer in Japan in 1979. The Act for the Protection of Personal Information was promulgated in 2003, and began to be enforced in 2005. The purpose of this Act is to protect the rights and interests of individuals while taking into consideration the usefulness of personal information, keeping in mind the remarkable increase in the use of personal information arising from the development of today's advanced information and communications society. The registry of esophageal cancer cases has required some improvements to comply with the Acts. The new registration system has been considered for several years and was finally completed in 2008. The most important point was "anonymity in an unlinkable fashion" using encryption with a "hash function". Finally, the registry resumed registering cases of esophageal cancer that had been treated in 2001.

We briefly summarized the Comprehensive Registry of Esophageal Cancer in Japan, 2002. A total of 4281 cases were registered from 222 institutions in Japan. As for the histologic type of cancer according to biopsy specimens, squamous cell carcinoma and adenocarcinoma accounted for 92.9% and 2.4%, respectively. Regarding clinical results, the 5-year survival rates of patients treated using endoscopic mucosal resection, concurrent chemoradiotherapy, radiotherapy alone, chemotherapy alone, or esophagectomy were 87.7%, 22.9%, 15.1%, 1.7%, and 44.1%, respectively. Concerning the approach used to perform an esophagectomy, 16.5% of the cases were performed endoscopically, that is, thoracoscopically, laparoscopically, or mediastinoscopically. Regarding the reconstruction route, the retrosternal, the posterior mediastinal and the intrathoracic route were used in 35.4%, 32.4% and 17.9% of cases, respectively. The percentage of operative deaths occurring within 30 days or less after operation and the percentage of postoperative hospital deaths occurring 31 days or more after operation were 1.2% (25 out of 2028 cases) and 2.0% (41 out of 2028 cases), respectively.

We hope that this Comprehensive Registry of Esophageal Cancer in Japan for 2002 helps to improve all aspects of the diagnosis and treatment of esophageal cancer.

These data were first issued on 1 March, 2010, as the *Comprehensive Registry of Esophageal Cancer in Japan, 2002*. Not all pages are reprinted here; however, the original table and figure numbers have been kept. The authors were at the time members of the Registration Committee for Esophageal Cancer, the Japan Esophageal Society, and made great contributions in preparing this material.

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Contents

I. Clinical factors of esophageal cancer patients treated in 2002

1. Institution-registered cases in 2002

Institutions	Institutions
Aichi Cancer Center	Kikuna Memorial Hospital
Aizawa Hospital	Kin-ikyo Chuo Hospital
Akita University Hospital	Kinki Central Hospital
Asahikawa Medical College Hospital	Kinki University Hospital
Chiba Cancer Center	Kinki University Nara Hospital
Chiba Prefecture Sawara Hospital	Kiryu Kosei General Hospital
Chiba University Hospital	Kitakyushu Municipal Medical Center
Chubu Rosai Hospital	Kitasato University Hospital
Dokkyo Medical University Hospital	Kobe City Medical Center General Hospital
Foundation for Detection of Early Gastric Carcinoma	Kobe University Hospital
Fuchu Hospital	Kumamoto University Hospital
Fujioka General Hospital	Kurume Daiichi Social Insurance Hospital
Fujita Health University	Kurume University Hospital
Fujita Health University Banbuntane Hotokukai Hospital	Kuwana City Hospital
Fukaya Red Cross Hospital	Kyorin University Hospital
Fukaya University Chikushi Hospital	Kyoto Daini Sekijuji Hospital
Fukuoka University Hospital	Kyoto University Hospital
Fukuyama Hospital	Kyushu Central Hospital
Gunma Central General Hospital	Kyushu University Hospital
Gunma Prefecture Cancer Center	Kyushu University Hospital at Beppu
Gunma University Hospital	Matsuda Hospital
Hachinohe City Hospital	Matsudo City Hospital
Hachioji Digestive Disease Hospital	Matsushita Memorial Hospital
Hakodate Goryokaku Hospital	Matsuyama Red Cross Hospital
Hamamatsu University School of Medicine, University Hospital	Mie University Hospital
Hannan Chuo Hospital	Mito Red Cross Hoapital
Health Insurance Naruto Hospital	Miyazaki Social Insurance Hospital
Hiratsuka City Hospital	Murakami General Hospital
Hiratsuka Kyosai Hospital	Mutsu General Hospital
Hiroshima City Asa Hospital	Nagahama City Hospital
Hiroshima University Research Institute for Radiation Biology Medicine	Nagano Prefectual Kiso Hospital
Hofu Institute of Gastroenterology	Nagano Red Cross Hospital
Hokkaido University Hospital	Nagaoka Chuo General Hospital
Hyogo Prefectural Nishinomiya Hospital	Nagasaki University Hospital
Ida Municipal Hospital	Nagayoshi General Hospital
Imazato Icho Hospital	Nagoya City University Hospital
International University of Health and Welfare Mita Hospital	Nagoya Daiichi Red Cross Hospital
Isehara Cooperation Hospital	Nagoya Tokushukai General Hospital
Ishikawa Kenritsu Chuo Hospital	Nagoya University Hospital
Ishinomaki Red Cross Hospital	Nanpuh Hospital
Iwakuni Clinical Center	Nara Medical University Hospital
Iwakuni Medical Center	National Cancer Center Hospital
Iwate Medical University Hospital	National Cancer Center Hospital East
Iwate Prefecture Kitagami Hospital	National Defense Medical College Hospital
JFE Kenpo Kawatetsu Chiba Hospital	National Hospital Organization Chiba Medical Center
Jichi Medical University Hospital	National Hospital Organization Hakodate Hospital
Jikei University Hospital	National Hospital Organization Kanmon Medical Center
Juntendo University Hospital	National Hospital Organization Kasumigaura Medical Center
Juntendo University Shizuoka Hospital	National Hospital Organization Kyushu Cancer Center
Kagawa Prefectual Central Hospital	National Hospital Organization Matsumoto National Hospital
Kagoshima Kenritsu Satsunan Hospital	National Hospital Organization Nagano Medical Center
Kagoshima University Hospital	National Hospital Organization Nagasaki Medical Denter
Kanagawa Cancer Center	National Hospital Organization Osaka Natitional Hospital
Kanazawa University Hospital	National Hospital Organization Tochigi National Hospital
Kansai Rosai Hospital	National Hospital Organization Tokyo Medical Center
Kashima Rosai Hospital	Nihon University Itabashi Hospital
Kawasaki Medical School Hospital	Nihonkai Genaral Hospital
Kawasaki Municipal Hospital	Niigata Cancer Center Hospital
Keio University Hospital	Niigata City General Hospital
Keiyukai Sapporo Hospital	Niigata Prefectural Shibata Hospital

Institutions	Institutions
Niigata University Medical and Dental Hospital	Sonoda Daiichi Hospital
Nikko Memorial Hospital	Southern Region Hospital
Nippon Medical School Chiba Hokusoh Hospital	St.Therese Hospital
Nippon Medical School Hospital	Sugita Genpaku Memorial Obama Municipal Hospital
Nippon Medical School Musashi Kosugi Hospital	Suita Municipal Hospital
Nippon Medical School Tama Nagayama Hospital	Showa University Toyosu Hospital
Nishi-Kobe Medical Center	Tachikawa Hospital
Nishinomiya Municipal Central Hospital	Takaoka Hospital
Nomura Hospital	Takasago Municipal Hospital
NTT East Japan Kanto Hospital	Teikyo University School of Medicine Hospital, Mizonokuchi
NTT West Osaka Hospital	Toho University Omori Medical Center
Numazu City Hospital	Tohoku Kosai Hospital
Obihiro Kosei Hospital	Tohoku University Hospital
Ohta General Hospital Foundation Ohta Nishinouchi Hospital	Tokai University Hospital
Oita Red Cross Hospital	Tokai University Tokyo Hospital
Okayama Saiseikai General Hospital	Tokushima University Hospital
Okayama University Hospital	Tokyo Dental College Ichikawa General Hospital
Onomichi Municipal Hospital	Tokyo Medical and Dental University Hospital
Osaka Koseinenkin Hospital	Tokyo Medical University Kasumigaura Hospital
Osaka Medical Center for Cancer and Cardiovascular Diseases	Tokyo Metropolitan Cancer and Infectious Center Komagome Hospital
Osaka Medical College Hospital	Tokyo Women's Medical University Hospital
Osaka Prefectural Hospital Organization Osaka General Medical Center	Tokyo Women's Medical University Medical Center East
Osaka Senin Hoken Hospital	Toranomon Hospital
Osaka University Hospital	Tottori Prefectural Central Hospital
Otsu Red Cross Hospital	Tottori University Hospital
Rinku General Medical Center City Izumisano Hospital	Toyama Hospital, International Medical Center of Japan
Saiseikai Fukushima General Hospital	Toyama Prefectual Central Hospital
Saiseikai Gose Hospital	Toyama University Hospital
Saiseikai Hiroshima Hospital	Tsuchiura Kyodo Hospital
Saiseikai Maebashi Hospital	Tsukuba University Hospital
Saiseikai Narashino Hospital	University of Fukui Hospital
Saiseikai Omura Hospital	University of the Ryukyu Hospital
Saitama City Hospital	Wakayama Medical University Hospital
Saitama Medical Center	Yamagata Prefectural Central Hospital
Saitama Medical Center Jichi Medical University	Yamagata University Hospital
Saitama Medical University Hospital	Yamaguchi University Hospital
Saitama Medical University International Medical Center	Yamanashi Prefectural Central Hospital
Saitama Red Cross Hospital	Yamanashi University Hospital
Saitama Social Insurance Hospital	Yao Municipal Hospital
Sakai Municipal Hospital	Yokohama City University
Saku Central Hospital	Yokohama City University Medical Hospital
Sanno Hospital	Yuri General Hospital
Seifukai Rakusei Hospital	
Seirojika National Hospital University Hospital	
Sendai City Hospital	
Sendai Medical Center	
Shiga University of Medical Science Hospital	
Shikoku Cancer Center	
Shimane University Hospital	
Shimura Hospital	
Shinshiro Municipal Hospital	
Shinshu University Hospital	
Shizuoka City Shizuoka Hospital	
Shouzankai Saiki Hospital	
Showa Inan General Hospital	
Showa University Fujigaoka Hospital	
Showa University Hospital	
Social Insurance Omuta Tenryo Hospital	
Social Insurance Tagawa Hospital	
Social Insurance Yokohama Central Hospital	

(Total 222 institutions)

2. Patient Background

Table 1 Age and gender

*** Excluding 9 cases of unknown gender**

Age	Male	Female	Unknown	Cases (%)
~29	2	0	0	2 (0.0%)
30~39	13	0	0	13 (0.3%)
40~49	126	31	0	157 (3.7%)
50~59	833	126	0	959 (22.6%)
60~69	1372	191	0	1563 (36.9%)
70~79	1141	173	0	1314 (31.0%)
80~89	161	47	0	208 (4.9%)
90~	13	6	0	19 (0.4%)
Total	3661	574	0	4235
Missing	29	8	0	37

A missing case was defined as a case in which no option was selected.

An unknown case was defined as a case in which the "Unknown" option was selected.

Table 12 Tumor location

*** Excluding 440 treatment unknown, missing cases concerning treatment type**

Location of tumor	Endoscopic treatment (%)		Chemotherapy and/or radiotherapy (%)		Surgery				Total (%)	
					Palliative operation (%)		Esophagectomy (%)			
Cervical	7	(1.6%)	82	(6.5%)	1	(1.1%)	62	(3.1%)	152	(4.0%)
Upper thoracic	60	(13.3%)	207	(16.4%)	17	(19.1%)	225	(11.2%)	509	(13.4%)
Middle thoracic	264	(58.7%)	645	(51.1%)	40	(44.9%)	1019	(50.7%)	1968	(51.6%)
Lower thoracic	85	(18.9%)	276	(21.9%)	25	(28.1%)	536	(26.7%)	922	(24.2%)
Abdominal	13	(2.9%)	27	(2.1%)	4	(4.5%)	126	(6.3%)	170	(4.5%)
EG	1	(0.2%)	0		2	(2.2%)	12	(0.6%)	15	(0.4%)
EG-Junction(E=G)	2	(0.4%)	3	(0.2%)	0		13	(0.6%)	18	(0.5%)
Cardia (G)	1	(0.2%)	1	(0.1%)	0		3	(0.1%)	5	(0.1%)
Others	0		0		0		0		0	
Unknown	17	(3.8%)	21	(1.7%)	0		14	(0.7%)	52	(1.4%)
Total	450		1262		89		2010		3811	
Missing	4		2		0		9		15	

EG: esophagogastric

Table 15 Histologic types of cancer according to biopsy specimens

*** Excluding 440 treatment unknown, missing cases concerning treatment type**

Histologic types	Endoscopic treatment (%)		Chemotherapy and/or radiotherapy (%)		Surgery				Total (%)	
					Palliative operation (%)		Esophagectomy (%)			
Not examined	13	(2.9%)	9	(0.7%)	0		10	(0.5%)	32	(0.8%)
SCC	403	(90.2%)	1186	(94.0%)	83	(93.3%)	1862	(92.7%)	3534	(92.9%)
SCC	300	(67.1%)	640	(50.7%)	41	(46.1%)	1005	(50.0%)	1986	(52.2%)
Well diff.	23	(5.1%)	70	(5.5%)	5	(5.6%)	195	(9.7%)	293	(7.7%)
Moderately diff.	66	(14.8%)	307	(24.3%)	30	(33.7%)	494	(24.6%)	897	(23.6%)
Poorly diff.	14	(3.1%)	169	(13.4%)	7	(7.9%)	168	(8.4%)	358	(9.4%)
Adenocarcinoma	16	(3.6%)	15	(1.2%)	3	(3.4%)	57	(2.8%)	91	(2.4%)
Undifferentiated	2	(0.4%)	15	(1.2%)	0		10	(0.5%)	27	(0.7%)
Carcinosarcoma	0		5	(0.4%)	0		9	(0.4%)	14	(0.4%)
Malignant melanoma	0		1	(0.1%)	0		5	(0.2%)	6	(0.2%)
Other tumors	2	(0.4%)	7	(0.6%)	1	(1.1%)	17	(0.8%)	27	(0.7%)
Dysplasia	0		0		0		0		0	
Unknown	11	(2.5%)	24	(1.9%)	2	(2.2%)	38	(1.9%)	75	(2.0%)
Total	447		1262		89		2008		3806	
Missing	9		6		0		20		35	

SCC: squamous cell carcinoma

Table 19 Organs with metastasis in cM1 case (clinical TNM-classification)

*** Excluding 440 treatment unknown, missing cases concerning treatment type**

Metastatic organs	Endoscopic treatment (%)		Chemotherapy and/or radiotherapy (%)		Surgery				Total (%)	
					Palliative operation (%)		Esophagectomy (%)			
PUL	7	(35.0%)	75	(20.5%)	1	(14.3%)	11	(6.9%)	94	(17.0%)
OSS	1	(5.0%)	13	(3.6%)	0		0		14	(2.5%)
HEP	5	(25.0%)	76	(20.8%)	3	(42.9%)	11	(6.9%)	95	(17.2%)
BRA	1	(5.0%)	7	(1.9%)	0		1	(0.6%)	9	(1.6%)
LYM	5	(25.0%)	166	(45.4%)	2	(28.6%)	126	(78.8%)	299	(54.1%)
MAR	0		0		1	(14.3%)	0		1	(0.2%)
PLE	0		4	(1.1%)	0		0		4	(0.7%)
PER	0		3	(0.8%)	0		1	(0.6%)	4	(0.7%)
SKI	0		5	(1.4%)	0		5	(3.1%)	10	(1.8%)
OTH	1	(5.0%)	15	(4.1%)	0		3	(1.9%)	19	(3.4%)
Unknown	0		2	(0.5%)	0		2	(1.3%)	4	(0.7%)
Lesions	20		366		7		160		553	
Missing	3		54		1		5		63	
One organ	11	(73.3%)	270	(85.7%)	5	(83.3%)	154	(97.5%)	440	(89.1%)
Two organs	3	(20.0%)	36	(11.4%)	1	(16.7%)	2	(1.3%)	42	(8.5%)
Three organs	1	(6.7%)	6	(1.9%)	0		0		7	(1.4%)
Four organs~	0		1	(0.3%)	0		0		1	(0.2%)
Unknown	0		2	(0.6%)	0		2	(1.3%)	4	(0.8%)
Total cases	15		315		6		158		494	
Missing	3		54		1		5		63	

PUL: lung, OSS: bone, HEP: liver, BRA: brain, LYM: lymph node, MAR: marrow,

PLE: pleural membrane, PER:peritoneal membrane, SKI: skin, OTH: others

Table 20 Clinical Stage (clinical TNM-classification)

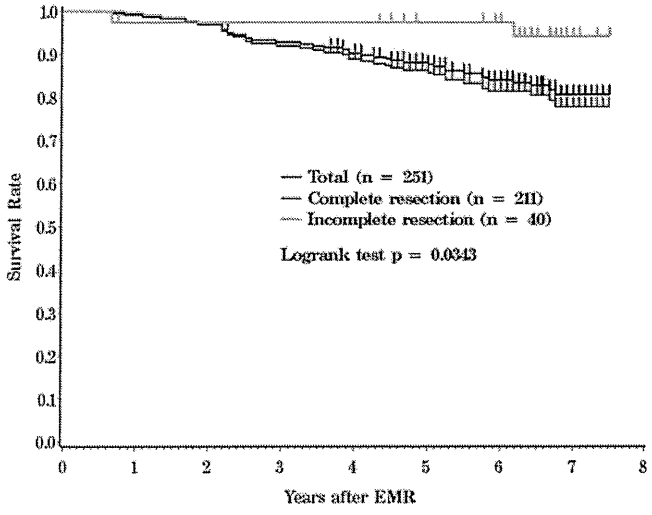
*** Excluding 440 treatment unknown, missing cases of concerning treatment type**

cStage	Endoscopic treatment (%)		Chemotherapy and/or radiotherapy (%)		Surgery				Total (%)	
					Palliative operation (%)		Esophagectomy (%)			
0	84	(18.7%)	4	(0.3%)	1	(1.1%)	14	(0.7%)	103	(2.7%)
I	292	(65.0%)	149	(11.8%)	11	(12.4%)	473	(23.5%)	925	(24.3%)
IIA	2	(0.4%)	125	(9.9%)	19	(21.3%)	388	(19.3%)	534	(14.0%)
IIB	2	(0.4%)	78	(6.2%)	7	(7.9%)	281	(14.0%)	368	(9.7%)
III	21	(4.7%)	450	(35.7%)	38	(42.7%)	654	(32.5%)	1163	(30.5%)
IV	0		79	(6.3%)	2	(2.2%)	27	(1.3%)	108	(2.8%)
IVA	6	(1.3%)	70	(5.6%)	1	(1.1%)	76	(3.8%)	153	(4.0%)
IVB	10	(2.2%)	196	(15.6%)	4	(4.5%)	53	(2.6%)	263	(6.9%)
Unknown	32	(7.1%)	109	(8.7%)	6	(6.7%)	44	(2.2%)	191	(5.0%)
Total	449		1260		89		2010		3808	
Missing	7		8		0		18		33	

II. Clinical results in patients treated endoscopically in 2002

Table 21 Treatment modalities in patients receiving endoscopy

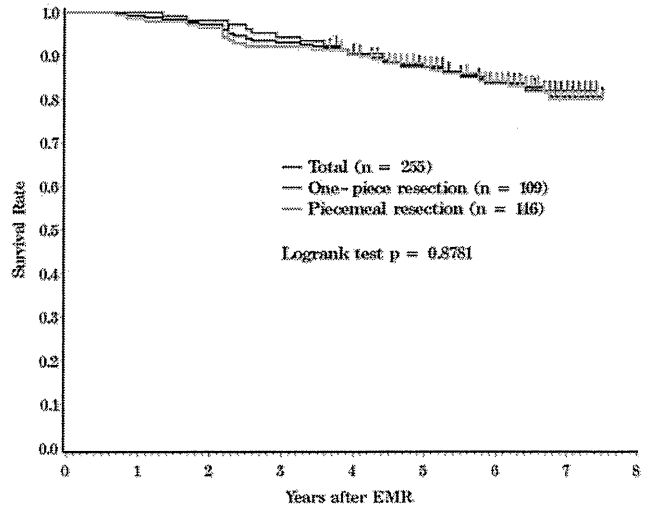
Treatment modarities	Cases (%)
Endoscopic treatment only	395 (86.6%)
Endoscopic treatment + radiotherapy	23 (5.0%)
Endoscopic treatment + chemotherapy	8 (1.8%)
Endoscopic treatment + chemoradiotherapy	30 (6.6%)
Endoscopic treatment + chemoradiotherapy + others	0
Endoscopic treatment + others	0
Total	456
Missing	0



	Years after EMR							
	1	2	3	4	5	6	7	8
Total	99.2%	97.1%	92.9%	90.3%	87.7%	84.1%	80.7%	80.7%
Complete resection	99.5%	97.0%	92.0%	89.0%	85.8%	81.5%	77.9%	77.9%
Incomplete resection	97.4%	97.4%	97.4%	97.4%	97.4%	97.4%	94.2%	94.2%

EMR: endoscopic mucosal resection

Figure 1 Survival of patients treated by EMR



	Years after EMR							
	1	2	3	4	5	6	7	8
Total	99.2%	97.1%	93.0%	90.5%	87.4%	83.9%	80.6%	80.6%
One-piece resection	100.0%	98.1%	94.2%	90.4%	87.4%	83.7%	81.9%	81.9%
Piecemeal resection	98.6%	96.4%	92.0%	90.6%	87.5%	84.1%	79.9%	79.9%

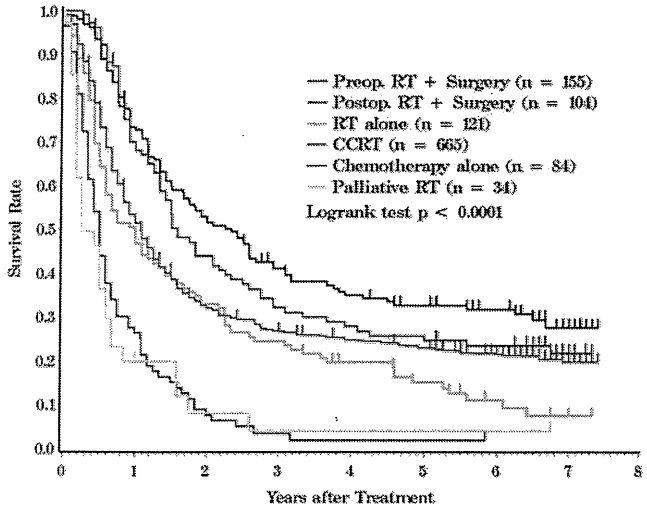
Figure 2 Survival of patients in relation to type of EMR

III. Clinical results in patients treated with chemotherapy and / or radiotherapy in 2002

Table 34 Dose of irradiation with or without chemotherapy (non-surgically treated and curative cases)

Dose of irradiation (Gy)	Chemotherapy with (%)		Chemotherapy without (%)		Preop. RT (%)		Postop. RT (%)	
0	0		0		0		0	
-29	5	(1.6%)	2	(2.5%)	8	(3.8%)	3	(2.2%)
30-39	8	(2.5%)	2	(2.5%)	78	(37.3%)	11	(8.1%)
40-49	20	(6.3%)	2	(2.5%)	103	(49.3%)	61	(45.2%)
50-59	17	(5.3%)	8	(10.0%)	1	(0.5%)	30	(22.2%)
60-69	218	(68.6%)	53	(66.3%)	17	(8.1%)	27	(20.0%)
70-	50	(15.7%)	13	(16.3%)	2	(1.0%)	3	(2.2%)
Total	318		80		209		135	
Median (min - max)	60 (9 - 100)		64 (3.6 - 72)		40 (2 - 70)		46 (14 - 125.6)	
Missing	22		10		20		34	

RT: radiotherapy

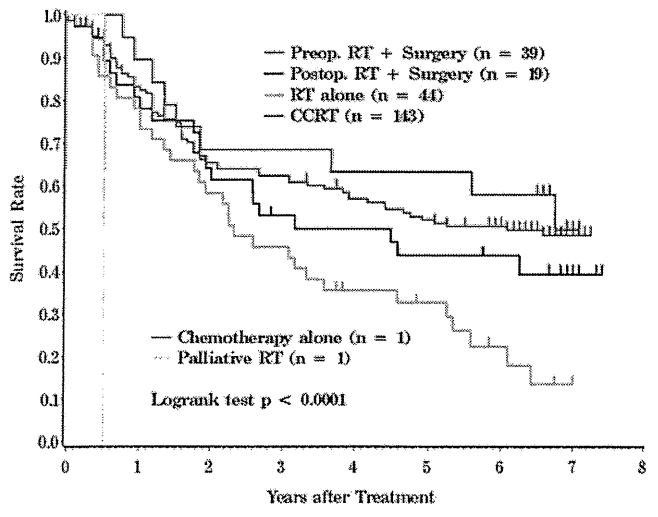


	Years after Treatment							
	1	2	3	4	5	6	7	8
Preop. RT + Surgery	72.6%	52.8%	41.0%	34.9%	32.6%	31.7%	27.5%	27.5%
Postop. RT + Surgery	67.9%	43.8%	32.0%	27.8%	24.6%	23.4%	21.6%	21.6%
RT alone	46.8%	32.8%	24.4%	19.6%	15.1%	11.0%	7.3%	7.3%
CCRT	51.3%	32.3%	26.8%	24.8%	22.9%	21.6%	19.6%	19.6%
Chemotherapy alone	26.3%	8.8%	3.3%	1.7%	1.7%	1.7%	-	-
Palliative RT	19.9%	7.9%	4.0%	4.0%	4.0%	4.0%	4.0%	-

RT: radiotherapy

CCRT: concurrent chemoradiotherapy

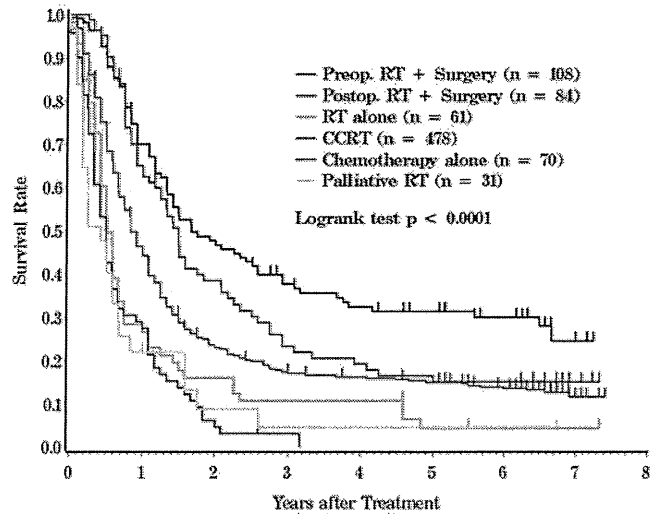
Figure 3 Survival of patients treated by chemotherapy and / or radiotherapy



* The curve of chemotherapy alone is over the curve of palliative RT.

	Years after Treatment							
	1	2	3	4	5	6	7	8
Preop. RT + Surgery	78.0%	64.1%	52.9%	49.8%	43.6%	43.6%	39.2%	39.2%
Postop. RT + Surgery	89.5%	68.4%	68.4%	63.2%	63.2%	57.9%	49.6%	49.6%
RT alone	73.3%	58.2%	45.6%	35.4%	32.5%	22.3%	13.4%	13.4%
CCRT	82.3%	65.4%	62.3%	56.8%	52.0%	50.3%	48.2%	48.2%
Chemotherapy alone	0.0%	-	-	-	-	-	-	-
Palliative RT	0.0%	-	-	-	-	-	-	-

Figure 4 Survival of patients treated by chemotherapy and / or radiotherapy (cStage I-IIA)



	Years after Treatment							
	1	2	3	4	5	6	7	8
Preop. RT + Surgery	69.9%	47.6%	37.7%	32.4%	31.3%	29.9%	24.4%	24.4%
Postop. RT + Surgery	62.3%	38.4%	23.3%	19.2%	15.1%	15.1%	15.1%	15.1%
RT alone	26.5%	15.9%	10.6%	10.6%	4.2%	4.2%	4.2%	-
CCRT	44.1%	23.4%	17.3%	16.1%	14.9%	13.8%	11.6%	11.6%
Chemotherapy alone	27.4%	6.1%	3.0%	0.0%	-	-	-	-
Palliative RT	21.9%	8.8%	4.4%	4.4%	4.4%	4.4%	4.4%	-

Figure 5 Survival of patients treated by chemotherapy and / or radiotherapy (cStage IIB-IVB)

IV. Clinical results in patients treated by esophagectomy in 2002

Table 45 Tumor locations

Locations	Cases (%)
Cervical	62 (3.1%)
Upper thoracic	225 (11.1%)
Middle thoracic	1019 (50.5%)
Lower thoracic	536 (26.5%)
Abdominal	126 (6.2%)
EG	12 (0.6%)
EG-Junction (E=G)	13 (0.6%)
Unknown	14 (0.7%)
Total lesions	2007
Total cases	2007
Missing	9

EG: esophagogastric

Table 46 Approaches to tumor resection

Approaches	Cases (%)
Cervical approach	82 (4.5%)
Right thoracotomy	1433 (78.1%)
Left thoracotomy	38 (2.1%)
Left thoracoabdominal approach	51 (2.8%)
Laparotomy	67 (3.6%)
Transhiatal (without blunt dissection)	14 (0.8%)
Transhiatal (with blunt dissection)	97 (5.3%)
Sternotomy	8 (0.4%)
Others	38 (2.1%)
Unknown	8 (0.4%)
Total	1836
Missing	192

Table 47 Endoscopic surgery

Endoscopic surgery	Cases (%)
None	1516 (83.2%)
Thoracoscopy-assisted	180 (9.9%)
Laparoscopy-assisted	48 (2.6%)
Thoracoscopy + Laparoscopy-assisted	41 (2.3%)
Mediastinoscopy-assisted	27 (1.5%)
Thoracoscopy + Mediastinoscopy-assisted	2 (0.1%)
Laparoscopy + Mediastinoscopy-assisted	2 (0.1%)
Others	0
Unknown	6 (0.3%)
Total	1822
Missing	206

Table 48 Fields of lymph node dissection according to the location of the tumor

*** Excluding missing 32 cases concerning location**

Locations	Cervical	Upper thoracic	Middle thoracic	Lower thoracic	Abdominal	EGJ	Total
Region of lymphadenectomy	Cases (%)	Cases (%)	Cases (%)	Cases (%)	Cases (%)	Cases (%)	Cases (%)
None	2 (2.3%)	11 (5.6%)	29 (3.1%)	13 (2.7%)	5 (4.3%)	2 (8.0%)	62 (3.4%)
C	25 (45.5%)	5 (2.5%)	33 (3.5%)	5 (1.1%)	1 (0.9%)	0	69 (3.8%)
C+UM	10 (18.2%)	4 (2.0%)	1 (0.1%)	0	0	0	15 (0.8%)
C+UM+MLM	2 (3.6%)	7 (3.5%)	13 (1.4%)	10 (2.1%)	0	1 (4.0%)	33 (1.8%)
C+UM+MLM+A	10 (18.2%)	103 (52.0%)	380 (40.6%)	142 (29.8%)	8 (6.8%)	0	643 (35.6%)
C+UM+A	2 (3.6%)	1 (0.5%)	1 (0.1%)	1 (0.2%)	0	0	5 (0.3%)
C+MLM	0	1 (0.5%)	0	0	0	0	1 (0.1%)
C+MLM+A	1 (1.8%)	1 (0.5%)	7 (0.7%)	2 (0.4%)	2 (1.7%)	0	13 (0.7%)
C+A	0	2 (1.0%)	1 (0.1%)	0	0	0	3 (0.2%)
UM	0	0	10 (1.1%)	3 (0.6%)	0	0	13 (0.7%)
UM+MLM	0	5 (2.5%)	17 (1.8%)	5 (1.1%)	1 (0.9%)	0	28 (1.6%)
UM+MLM+A	3 (5.5%)	46 (23.2%)	360 (38.5%)	192 (40.3%)	20 (17.1%)	6 (24.0%)	627 (34.7%)
UM+A	0	2 (1.0%)	5 (0.5%)	2 (0.4%)	0	0	9 (0.5%)
MLM	0	2 (1.0%)	8 (0.9%)	8 (1.7%)	4 (3.4%)	0	22 (1.2%)
MLM+A	0	5 (2.5%)	48 (5.1%)	63 (13.2%)	51 (43.6%)	7 (28.0%)	174 (9.6%)
A	0	3 (1.5%)	17 (1.8%)	26 (5.5%)	24 (20.5%)	9 (36.0%)	79 (4.4%)
Unknown	0	0	5 (0.5%)	4 (0.8%)	1 (0.9%)	0	10 (0.6%)
Total	55	198	935	476	117	25	1806
Missing	7	27	84	60	12	0	190

C: bilateral cervical nodes

UM: upper mediastinal nodes

MLM: middle-lower mediastinal nodes

A: abdominal nodes

Table 49 Extent of lymph node dissection

Grade of dissection (D)	Cases (%)
DX	18 (1.0%)
D0	111 (6.1%)
DI	270 (14.9%)
DII	843 (46.4%)
DIII	576 (31.7%)
Total	1818
Missing	210

Table 50 Reconstruction route

Reconstruction route	Cases (%)
None	20 (1.1%)
Antethoracic	177 (9.7%)
Retrosternal	648 (35.4%)
Intrathoracic	327 (17.9%)
Posterior mediastinal	592 (32.4%)
Others	46 (2.5%)
Unknown	18 (1.0%)
Total	1828
Missing	200

Table 51 Organs used for reconstruction

Organs used for reconstruction	Cases (%)
None	28 (1.5%)
Whole stomach	35 (1.8%)
Gastric tube	1463 (77.2%)
Jejunum	79 (4.2%)
Free jejunum	34 (1.8%)
Colon	93 (4.9%)
Free colon	7 (0.4%)
Skin graft	0
Others	145 (7.7%)
Unknown	10 (0.5%)
Total lesions	1894
Total cases	1835
Missing	193

Table 58 Histological classification

Histological classification	Cases (%)
Not examined	5 (0.3%)
SCC	1656 (90.9%)
SCC	209 (11.5%)
Well diff.	380 (20.9%)
Moderately diff.	730 (40.1%)
Poorly diff.	337 (18.5%)
Adenocarcinoma	32 (1.8%)
Barrett's adenocarcinoma	23 (0.3%)
Adenosquamous cell carcinoma	13 (0.7%)
(Co-existing)	3 (0.2%)
(Mucoepidermoid carcinoma)	2 (0.1%)
Adenoid cystic carcinoma	0
Basaloid carcinoma	14 (0.8%)
Undiff. carcinoma (small cell)	10 (0.5%)
Undiff. carcinoma	2 (0.1%)
Other carcinoma	1 (0.1%)
Sarcoma	1 (0.1%)
Carcinosarcoma	15 (0.8%)
Malignant melanoma	2 (0.1%)
Dysplasia	1 (0.1%)
Other	21 (1.2%)
Unkown	20 (1.1%)
Total	1821
Missing	207

SCC: squamous cell carcinoma

Table 59 Depth of tumor invasion

pT-category	Cases (%)
pTX	9 (0.5%)
pT0	31 (1.7%)
pTis	24 (1.3%)
pT1a	145 (8.0%)
pT1b	450 (24.7%)
pT2	259 (14.2%)
pT3	781 (42.9%)
pT4	96 (5.3%)
Other	0
Unknown	25 (1.4%)
Total	1820
Missing	208

Table 60 Subclassification of superficial carcinoma

Subclassification	Cases (%)
Not superficial carcinoma	1152 (65.3%)
m1 (ep)	26 (1.5%)
m2 (lpm)	72 (4.1%)
m3 (mm)	72 (4.1%)
sm1	64 (3.6%)
sm2	103 (5.8%)
sm3	175 (9.9%)
Unknown	100 (5.7%)
Total	1764
Missing	264

ep: epithelium

lpm: lamina propria muosa

mm: muscularis mucosa

Table 61 Pathological grading of lymph node metastasis

Lymph node metastasis	Cases (%)
n (-)	749 (42.8%)
n1 (+)	296 (16.9%)
n2 (+)	419 (23.9%)
n3 (+)	138 (7.9%)
n4 (+)	118 (6.7%)
Unknown	30 (1.7%)
Total	1750
Missing	278

Table 62 Numbers of the metastatic nodes

Numbers of lymph node metastasis	Cases (%)
0	1014 (50.0%)
1-3	575 (28.4%)
4-7	221 (10.9%)
8-	171 (8.4%)
Unknown	47 (2.3%)
Total	2128
Missing	0

Table 63 Pathological findings of distant organ metastasis

Distant metastasis (M)	Cases (%)
MX	25 (1.4%)
M0	1762 (96.7%)
M1	36 (2.0%)
Total	1823
Missing	205

Table 64 Residual tumor

Residual tumor (R)	Cases (%)
RX	150 (8.4%)
R0	1437 (80.5%)
R1	105 (5.9%)
R2	92 (5.2%)
Total	1784
Missing	244

Table 75 Causes of death

*** As of August 31, 2009**

Cause of death	Cases (%)
Death due to recurrence	655 (71.1%)
Death due to other cancer	45 (4.9%)
Death due to other disease (rec+)	23 (2.5%)
Death due to other disease (rec-)	111 (12.1%)
Death due to other disease (rec?)	9 (1.0%)
Operative death*	25 (2.7%)
Postoperative hospital death**	41 (4.5%)
Unknown	12 (1.3%)
Total of death cases	921
Missing	14

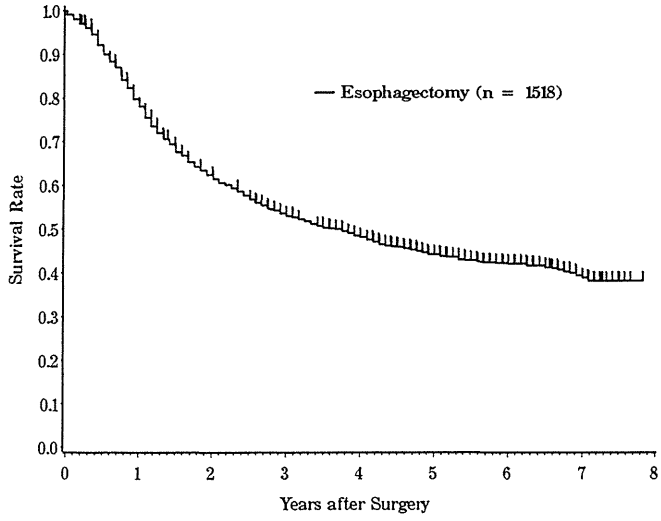
rec: recurrence

*** Death in 30 days or less, **Death after 30 days**

Follow-up period (years)	
Median (min - max)	2.67 (0.00 - 8.17)

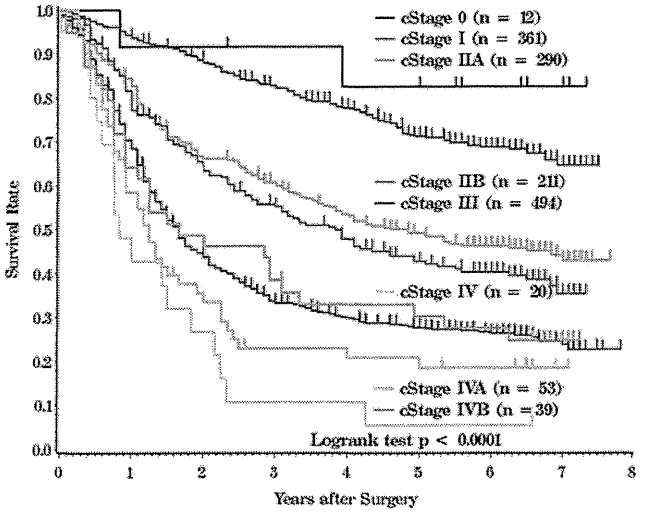
Table 76 Initial recurrent lesion

Initial recurrence lesion of fatal cases	Cases (%)
None	890 (43.1%)
Lymph node	448 (21.7%)
Lung	152 (7.4%)
Liver	142 (6.9%)
Bone	99 (4.8%)
Brain	26 (1.3%)
Primary lesion	80 (3.9%)
Dissemination	59 (2.9%)
Anastomotic region	6 (0.3%)
Others	55 (2.7%)
Unknown	110 (5.3%)
Total of recurrence lesion	2067
Total	1758
Missing	270



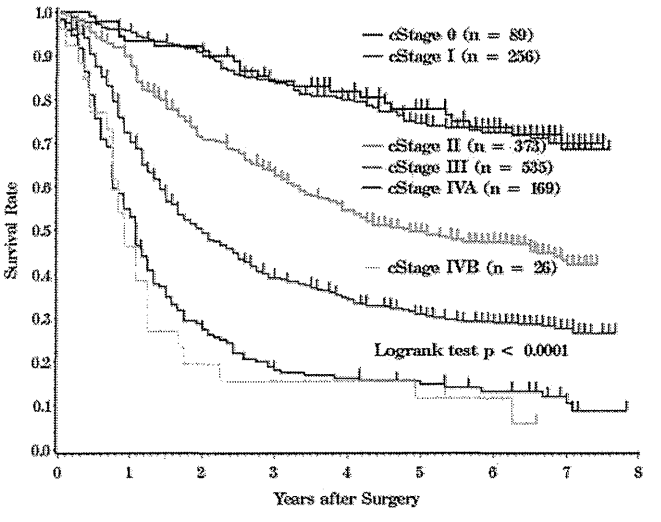
	Years after Surgery							
	1	2	3	4	5	6	7	8
Esophagectomy	78.0%	62.2%	53.6%	48.2%	44.1%	42.2%	39.4%	38.1%

Figure 6 Survival of patients treated by esophagectomy



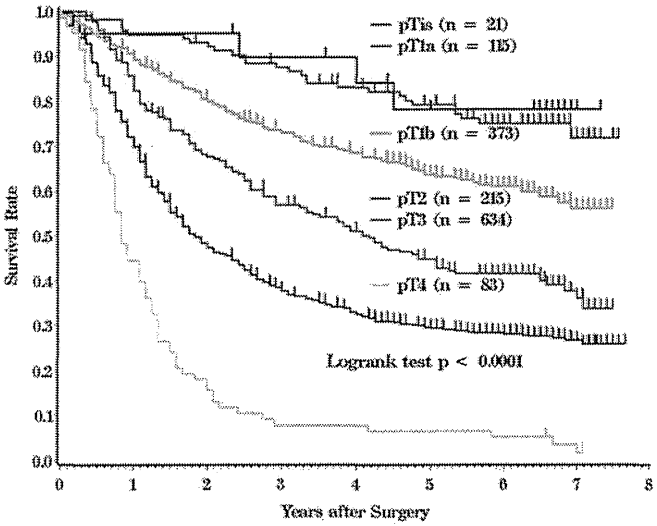
	Years after Surgery							
	1	2	3	4	5	6	7	8
cStage 0	91.7%	91.7%	91.7%	82.5%	82.5%	82.5%	82.5%	82.5%
cStage I	93.7%	88.5%	82.7%	77.6%	71.2%	68.7%	64.6%	64.6%
cStage IIA	82.6%	66.6%	60.7%	53.1%	49.2%	46.2%	44.1%	42.9%
cStage IIB	77.1%	64.9%	55.7%	47.8%	42.8%	40.3%	35.4%	35.4%
cStage III	68.4%	44.4%	33.7%	29.9%	27.7%	26.6%	24.5%	22.6%
cStage IV	42.7%	26.7%	10.7%	10.7%	5.3%	5.3%	5.3%	-
cStage IVA	58.5%	35.5%	22.9%	20.6%	18.4%	18.4%	18.4%	18.4%
cStage IVB	64.1%	48.7%	38.5%	33.0%	30.2%	27.5%	24.7%	24.7%

Figure 8 Survival of patients treated by esophagectomy in relation to clinical stage (UICC-cTNM)



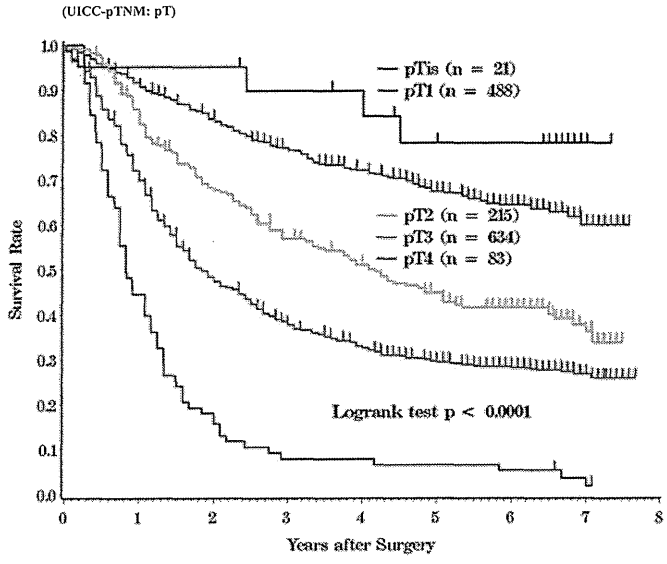
	Years after Surgery							
	1	2	3	4	5	6	7	8
cStage 0	93.3%	92.1%	84.1%	81.7%	77.8%	73.5%	68.5%	68.5%
cStage I	95.2%	95.2%	84.5%	79.8%	74.4%	72.3%	69.9%	69.9%
cStage II	87.5%	71.3%	63.6%	54.4%	49.5%	47.1%	43.0%	42.1%
cStage III	70.2%	50.1%	39.1%	34.2%	30.7%	29.1%	27.5%	26.5%
cStage IVA	52.9%	28.7%	18.7%	16.1%	14.8%	13.2%	12.0%	8.7%
cStage IVB	46.2%	19.2%	15.4%	11.5%	11.5%	11.5%	5.8%	-

Figure 7 Survival of patients treated by esophagectomy in relation to clinical stage



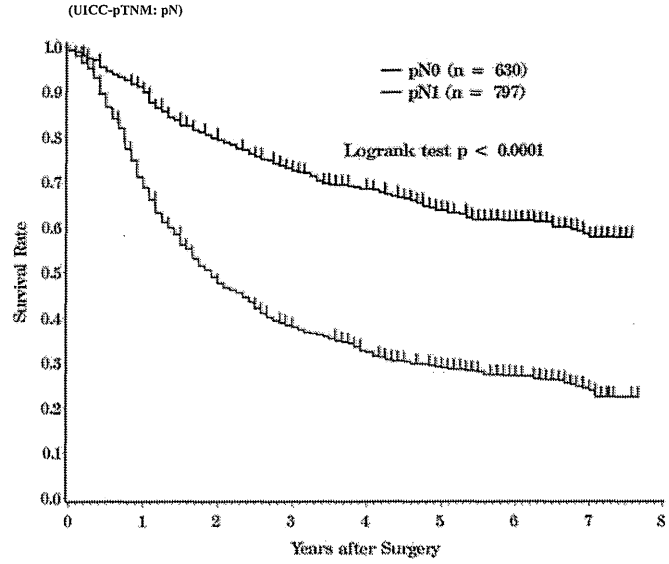
	Years after Surgery							
	1	2	3	4	5	6	7	8
pTis	95.0%	95.0%	89.7%	84.1%	78.1%	78.1%	78.1%	78.1%
pT1a	94.7%	92.9%	87.6%	83.0%	83.0%	75.0%	71.9%	71.9%
pT1b	89.3%	80.5%	73.6%	68.6%	63.6%	61.1%	56.1%	56.1%
pT2	82.4%	56.8%	56.7%	51.1%	44.9%	41.6%	37.7%	33.8%
pT3	69.8%	48.2%	38.4%	32.6%	29.4%	28.3%	26.7%	25.9%
pT4	44.6%	18.1%	7.8%	6.5%	5.2%	3.5%	3.5%	1.7%

Figure 9 Survival of patients treated by esophagectomy in relation to the depth of tumor invasion (pT)



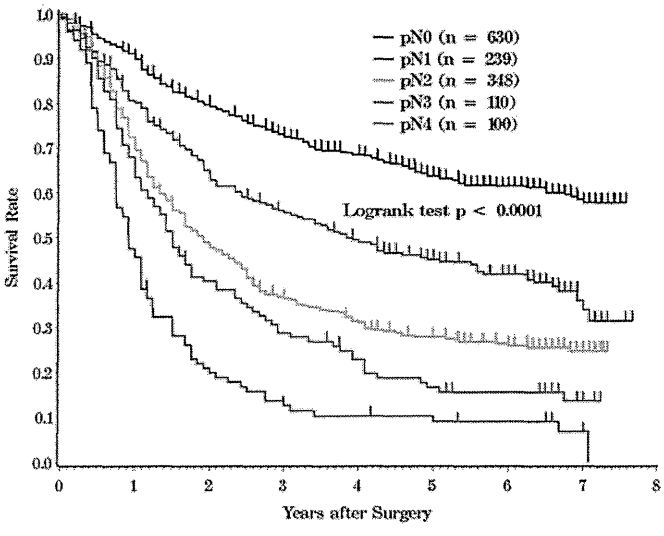
	Years after Surgery							
	1	2	3	4	5	6	7	8
pTis	95.0%	95.0%	89.7%	78.1%	78.1%	78.1%	78.1%	78.1%
pT1	90.5%	83.5%	77.0%	72.1%	67.3%	64.4%	60.0%	60.0%
pT2	82.4%	67.7%	56.8%	51.1%	44.9%	41.6%	37.7%	33.8%
pT3	69.8%	48.2%	38.4%	32.6%	29.4%	28.3%	26.7%	25.9%
pT4	44.6%	18.1%	7.8%	6.5%	6.5%	5.2%	3.5%	1.7%

Figure 10 Survival of patients treated by esophagectomy in relation to the depth of tumor invasion (UICC-pTNM: pT)



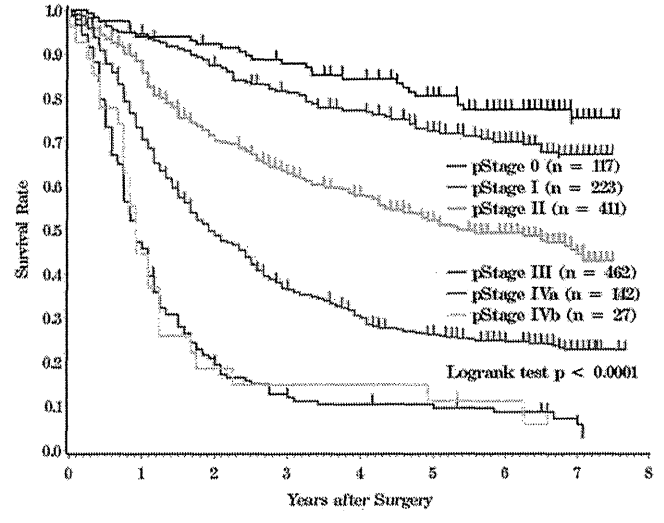
	Years after Surgery							
	1	2	3	4	5	6	7	8
pN0	89.9%	79.7%	72.9%	68.4%	63.6%	61.4%	58.4%	57.8%
pN1	68.7%	48.6%	38.3%	32.4%	28.9%	27.1%	24.3%	22.4%

Figure 12 Survival of patients treated by esophagectomy in relation to lymph node metastasis (UICC-pTNM: pN)



	Years after Surgery							
	1	2	3	4	5	6	7	8
pN0	89.9%	79.7%	72.9%	68.4%	63.6%	61.4%	58.4%	57.8%
pN1	80.2%	64.1%	55.9%	48.9%	45.0%	41.7%	35.9%	31.4%
pN2	69.5%	48.8%	36.7%	31.0%	27.8%	26.3%	24.7%	24.7%
pN3	63.3%	40.2%	28.7%	22.7%	16.5%	15.5%	13.5%	13.5%
pN4	45.5%	20.8%	13.5%	10.2%	8.9%	8.9%	6.7%	0.0%

Figure 11 Survival of patients treated by esophagectomy in relation to lymph node metastasis (pN)



	Years after Surgery							
	1	2	3	4	5	6	7	8
pStage 0	93.9%	92.2%	87.8%	84.2%	80.4%	77.3%	75.3%	75.3%
pStage I	94.4%	87.3%	81.6%	77.1%	72.4%	69.9%	67.0%	67.0%
pStage II	85.6%	71.2%	63.6%	57.8%	52.0%	49.2%	45.4%	42.9%
pStage III	70.5%	49.6%	36.7%	30.1%	26.1%	24.8%	22.8%	22.8%
pStage IVa	45.8%	20.8%	12.7%	10.3%	9.5%	8.5%	7.1%	2.8%
pStage IVb	44.4%	18.5%	14.8%	14.8%	11.1%	11.1%	5.6%	-

Figure 13 Survival of patients treated by esophagectomy in relation to pathological stage