

## Division of Bio-Medical Informatics

### Department of Epidemiology

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The main research activities of the Department of Epidemiology and Social Medicine have focused on epidemiological studies on the late effects of A-bomb detonation and on the actual conditions of the survivors from socio-medical viewpoints. These studies are based on the "database of A-bomb survivors in Hiroshima prefecture (ABS)". Under the intimate collaboration with the International Radiation Information Center, the staffs of our department have followed up information on A-bomb survivors to renew records of the ABS.

After a half century from A-bomb detonation, survivors have grown to old age. Thus, not only the late effects of A-bomb, but also geriatric and gerontological problems became serious issues for survivors. Epidemiological studies on these health problems have been also focused on in this department.

The main research projects of this department in 1997 fiscal year are summarized as follows.

#### 1. Cohort analysis of A-bomb survivors.

Hayakawa, N., Yoshida, S., Ikeuchi, M., Kasagi, K., Zhunussova, T., Suenaga, M., Sumida, H.<sup>\*</sup>, Hiraoka, M.<sup>\*</sup>, Takesaki, Y.  
(<sup>\*</sup>International Radiation Information Center)

From 1965, we have followed up a cohort of Hiroshima A-bomb survivors in Hiroshima prefecture to study on biological effect of A-bomb detonation. Comparing with general population of Hiroshima prefecture, we have tried to construct a basic database for the welfare and medical care of A-bomb victims. The main researches are as following.

- 1) Analysis by A-bomb dose based on ABS93D
- 2) Analysis of exposure status.
- 3) Analysis by the distance from the hypocenter.

- 4) Analysis of the effects by environment factors.
- 5) Study of disease development by family analysis.

## 2. Study on the assessment of cancer development by cohort analysis.

Hayakawa, N., Yoshida, S., Ikeuchi, M., Kasagi, F., Kasagi, K., Zhunussova, T., Suenaga, M., Sumida, H.<sup>\*</sup>, Hiraoka, M.<sup>\*</sup>, Takesaki, Y. (\*International Radiation Information Center)

To study the epidemiological factors of cancer development in the cohort of A-bomb survivors, we have collected about 9,700 specimens of frozen serum of survivors. Questionnaire of life-style have also been collected in 10,300 survivors and stored in the database. We have also finished to make linkage with the cohort of ABS, and 1523 death including 8 death from malignancy until December, 1999 has been confirmed.

## 3. Study of the changes in the followed-up fixed population of A-bomb survivors.

Kasagi, F., Hayakawa, N.

One of the methods used for epidemiologic studies is the cohort approach, by which a fixed population is followed over time. The data gathered in the cohort study of A-bomb survivors is an important resource of studies of the late effects of radiation. However, with the passage of time cohort members have died or dropped out decreasing the size and changing in the demographic characteristics of the cohort. The aim of the present study is to document how the fixed population changed over the years of follow-up, and to make projections about the future demographics of the A-bomb survivors.

## 4. Analysis of cancer mortality among A-bomb survivors using a two-stage model of carcinogenesis.

Matsuura, M.<sup>\*1</sup>, Luebeck, E.G.<sup>\*2</sup>, Moolgavkar, S.H.<sup>\*2</sup>, Hoshi, M.<sup>\*3</sup>, Hayakawa, N., Kai, M.<sup>\*4</sup> (\*<sup>1</sup>JFCR Cancer Inst. \*<sup>2</sup>Fred Hutchinson Cancer Research Center, \*<sup>3</sup>International Radiation Information Center, \*<sup>4</sup>Oita Univ. of Nursing and Health Sciences)

**Purpose:** Based on the stochastic carcinogenesis modeling proposed by Moolgavkar, we examine and search the phenomena that is related with radiation-induced cancer mechanism at the level of population among survivors.

**Methods and Results:** We reassessed a mathematical specification of protract effect models where we assumed radiation caused initiation during a certain period after the bombing. In the analyses for stomach, lung and colon cancer mortality data among survivors, we observed the acute effect models fits better than the protract effect models.

## 5. Study of the dynamic population for epidemiological study and its applications.

Matsuura, M.<sup>\*1</sup>, Hsu, L.<sup>\*2</sup>, Wang, C.Y.<sup>\*2</sup>, Kasagi, F., Hayakawa, N., Ohtaki, M.<sup>\*3</sup>  
(\*<sup>1</sup>JFCR Cancer Inst. \*<sup>2</sup>Fred Hutchinson Cancer Research Center, \*<sup>3</sup>Dept. Environmetrics and Biometrics)

**Purpose:** To develop the statistical theory on the dynamic population for epidemiological study, and to apply it to the various kinds of analyses of A-bomb survivors residing in Hiroshima Prefecture.

**Methods and Results:** Matsuura visited the Fred Hutchinson Cancer Research Center to discuss with Dr. Hsu and Dr. Wang about simulation study. As an application, we reported the results about risk analysis of lung and liver cancer mortality among A-bomb survivors at the 42nd Annual meeting of Late Effects of Atomic Bomb (Hiroshima, 2001).

## 6 . A Geographic Information System (GIS) analysis of spatial data on the damage of Hiroshima A-bomb

Takesaki, Y., Hayakawa, N.

Application of GIS has rapidly expanded according to increasing supply of various spatial data. This has also raised the usefulness of GIS promoting its popularization. Nevertheless, conventional paper maps or aerial photographs that are not digital data cannot be directly used with GIS. For this reason, application of GIS to historical events including Hiroshima A-bomb has been extremely limited.

Therefore it is significant for increasing and expanding the usage of GIS to analyze geographic data on Hiroshima A-bomb by making digital data.

The purpose of this study is to reconstruct the geographic information for precise estimation of the damage of A-bomb by making digital spatial data from existing analogue data of paper maps or aerial photographs and database of the related information with GIS.

### A. Original Papers

- 1 . Yatsuya, H.<sup>\*1</sup>, Toyoshima, H.<sup>\*1</sup>, Mizoue, T.<sup>\*2</sup>, Kondo, T.<sup>\*1</sup>, Tamakoshi, K.<sup>\*1</sup>, Hori, Y.<sup>\*1</sup>, Tokui, N.<sup>\*2</sup>, Hoshiyama, Y.<sup>\*3</sup>, Kikuchi, S.<sup>\*4</sup>, Sakata, K.<sup>\*5</sup>, Hayakawa, N., Tamakoshi, A.<sup>\*6</sup>, Ohno, Y.<sup>\*6</sup>, Yoshimura, T.<sup>\*2</sup> (\*<sup>1</sup>Dept. of Public Health/ Health Information Dynamics, Field of Social Life Science, Program in Health and Community Medicine, Nagoya University Graduate School of Medicine, \*<sup>2</sup>Dept. of Clinical Epidemiology, Institute of Industrial Ecological Sciences, University of Occupational and Environmental Health, Kitakyushu, \*<sup>3</sup>Dept. of Public Health, Showa University School of Medicine, \*<sup>4</sup>Dept. of Public Health, Aichi Medical University, \*<sup>5</sup>Dept. of Public Health, Wakayama Medical University, \*<sup>6</sup>Dept. of Preventive Medicine/Biostatistics and Medical Decision Making, Field of Social Life Science, Program in Health and Community Medicine, Nagoya University Graduate School of Medicine): Family history and the risk of stomach cancer death in Japan: differences by age and gender. *Int J Cancer* **97**, 688-694, 2002 (I)
- 2 . Katayama, H.<sup>\*1</sup>, Matsuura, M.<sup>\*2</sup>, Endo, S.<sup>\*3</sup>, Hoshi, M.<sup>\*4</sup>, Ohtaki, M.<sup>\*2</sup>, Hayakawa, N. (\*<sup>1</sup>Dept. of Information Technology, Radiation Effects Research Foundation, \*<sup>2</sup>Dept. of Environmetrics and Biometrics, \*<sup>3</sup>Applied Physics and Chemistry, Graduate School of Engineering, \*<sup>4</sup>International Radiation Information Center): Reassessment of the cancer mortality risk among Hiroshima atomic-bomb survivors using a new dosimetry system, ABS2000D, compared with ABS93D. *J Radiat Res* **43**, 53-64. 2002 (I)
- 3 . Hoshiyama, Y.<sup>\*1</sup>, Kawaguchi, T.<sup>\*1</sup>, Miura, Y.<sup>\*2</sup>, Mizoue, T.<sup>\*3</sup>, Tokui, N.<sup>\*3</sup>, Yatsuya, H.<sup>\*4</sup>, Sakata, K.<sup>\*5</sup>, Kondo, T.<sup>\*4</sup>, Kikuchi, S.<sup>\*6</sup>, Toyoshima, H.<sup>\*4</sup>, Hayakawa, N., Tamakoshi, A.<sup>\*7</sup>, Ohno, Y.<sup>\*7</sup>, Yoshimura, T.<sup>\*3</sup> (\*<sup>1</sup>Dept. of Public Health, Showa University School of Medicine, \*<sup>2</sup>Dept. of Nursing, Saitama University, \*<sup>3</sup>Dept. of Clinical Epidemiology, Institute of Industrial Ecological Sciences, University of Occupational and Environmental Health, \*<sup>4</sup>Dept. of Public Health/Health Information Dynamics, Field of Social Life Science, Program in Health and Community Medicine, Nagoya University Graduate School of Medicine, \*<sup>5</sup>Dept. of Public Health, Wakayama Medical University, \*<sup>6</sup>Dept. of Public Health, Aichi Medical University, \*<sup>7</sup>Dept. of Preventive Medicine/Biostatistics and Medical Decision Making, Field of Social Life Science, Program in Health and Community Medicine, Nagoya University Graduate School of Medicine): A prospective study of stomach cancer death in relation to green tea consumption in Japan. *Br J Cancer* **87**, 309-313, 2002 (I)
- 4 . Hayakawa, N.: Epidemiological study on the late effect of atomic bomb radiation in the future. *Hiroshima Igaku* **55**, 141-143, 2002 (C)

5. Suenaga, M., Hayakawa, N., Hattori, N.<sup>\*1</sup>, Matsuura, M.<sup>\*2</sup>, Kasagi, K., Yoshida, S., Ikeuchi, M., Zhunussova, T. (<sup>\*1</sup>Radiation Effects Research Foundation, <sup>\*2</sup>Dept. Environmetrics and Biometrics): Study on reliability and validity about history of cancer. *Hiroshima Igaku* **55**, 184-186, 2002 (C)
  
6. Takeichi, N.<sup>\*1</sup>, Hoshi, M.<sup>\*2</sup>, Tanaka, K.<sup>\*3</sup>, Zhumadilov, Z.<sup>\*2</sup>, Hayakawa, N., Okamoto, T.<sup>\*4</sup>, Yasui, W.<sup>\*5</sup>, Maeda, R.<sup>\*6</sup>, Shimizu, K.<sup>\*7</sup> (<sup>\*1</sup>Takeichi Thyroid Medical Clinic, <sup>\*2</sup>International Radiation Information Center, <sup>\*3</sup>Dept. of Radiology, <sup>\*4</sup>Dept. of Oral Surgery, <sup>\*5</sup>Dept. of Pathology, <sup>\*6</sup>Health Management Center, Hiroshima Atomic Bomb Casualty Council, <sup>\*7</sup>Dept. of Surgery, Nippon Medical School): Micronucleus in thiroid cells among A-bomb exposed survivors in Hiroshima. And additional cases in Semipalatinsk. *Hiroshima Igaku* **55**, 198-201, 2002 (C)
  
7. Takeuchi, Y.<sup>\*1</sup>, Sato, K.<sup>\*2</sup>, Ohtaki, M.<sup>\*2</sup>, Hayakawa, N., Tanaka, H.<sup>\*3</sup>, Kimura, A.<sup>\*3</sup> (<sup>\*1</sup>Hiroshima Red Cross Blood Center, <sup>\*2</sup>Dept. Environmetrics and Biometrics, <sup>\*3</sup>Dept. Hematology and Oncology): Increased risk of myelodysplastic syndrome (MDS) in atomic bomb survivors. *Hiroshima Igaku* **55**, 214-215, 2002
  
8. Zhunussova, T., Matsuura, M.<sup>\*1</sup>, Kasagi, K., Hattori, N., Yoshida, S., Suenaga, M., Ikeuchi, M., Hayakawa, N. (<sup>\*1</sup>Dept. Environmetrics and Biometrics): Risk analysis of liver cancer motality between 1968 and 1997 among Atomic Bomb Survivors in Hiroshima Prefecture. *Hiroshima Igaku* **55**, 175-177, 2002
  
9. Aoki, S.<sup>\*1</sup>, Haruma, K.<sup>\*2</sup>, Kusunoki, H.<sup>\*1</sup>, Hata, J.<sup>\*1</sup>, Hara, M.<sup>\*1</sup>, Yoshida, S., Tanaka, S.<sup>\*3</sup>, Chayama, K.<sup>\*1</sup> (<sup>\*1</sup>Dept. of First internal medicine, <sup>\*2</sup>Division of Gastroenterology, Kawasaki Medical School, <sup>\*3</sup>Dept. of Endoscopy): Evaluation of gastric emptying measured with the <sup>13</sup>C-octanoic acid breath test in patients with functional dyspepsia: comparison with ultrasonography. *Scand J Gastroenterol* **37**, 662-666, 2002 (I)
  
10. Okanobu, H.<sup>\*1</sup>, Hata, J.<sup>\*1</sup>, Haruma, K.<sup>\*2</sup>, Matsumura, S.<sup>\*1</sup>, Yoshida, S., Kitadai, Y.<sup>\*1</sup>, Tanaka, S.<sup>\*3</sup>, Chayama, K.<sup>\*1</sup> (<sup>\*1</sup>Dept. of First internal medicine, <sup>\*2</sup>Division of Gastroenterology, Kawasaki Medical School, <sup>\*3</sup>Dept. of Endoscopy): Preoperative assessment of gastric cancer vascularity by flash echo imaging. *Scand J Gastroenterol* **37**, 608-612, 2002 (I)
  
11. Manabe, N.<sup>\*1</sup>, Haruma, K.<sup>\*2</sup>, Hata, J.<sup>\*1</sup>, Kusunoki, H.<sup>\*1</sup>, Yoshida, S., Futagami, K.<sup>\*1</sup>, Tanaka, S.<sup>\*3</sup>, Chayama, K.<sup>\*1</sup> (<sup>\*1</sup>Dept. of First internal medicine, <sup>\*2</sup>Division of Gastroenterology, Kawasaki Medical School, <sup>\*3</sup>Dept. of Endoscopy): Evaluation of esophageal motility by endosonography using a miniature ultrasonographic probe in patients with reflux esophagitis. *Scand J Gastroenterol* **37**, 674-678, 2002 (I)
  
12. Kusunoki, H.<sup>\*1</sup>, Mitsuoka, M.<sup>\*1</sup>, Kunihiro, K.<sup>\*1</sup>, Hara, M.<sup>\*1</sup>, Okanobu, H.<sup>\*1</sup>, Nakamura, K.<sup>\*1</sup>, Manabe, N.<sup>\*1</sup>, Yoshida, S., Shimatani, T.<sup>\*2</sup>, Sumii, M.<sup>\*1</sup>, Tanaka, S.<sup>\*3</sup>, Yoshihara, M.<sup>\*4</sup>, Chayama, K.<sup>\*1</sup>, Haruma, K.<sup>\*5</sup>, Hata, J.<sup>\*1</sup>, Inoue, M.<sup>\*2</sup> (<sup>\*1</sup>Dept. of First internal medicine, <sup>\*2</sup>Division of General Medicine, <sup>\*3</sup>Dept. of Endoscopy, <sup>\*4</sup>Health Service Center, <sup>\*5</sup>Division of Gastroenterology, Kawasaki Medical School): Evaluation of gastroduodenal motility before and after mosapride citrate administration in the Functional Dyspepsia patient using the transabdominal ultrasonography (The 2nd report). *Therapeutic Research* **23**, 413-415, 2002
  
13. Onogawa, S.<sup>\*1</sup>, Tanaka, S.<sup>\*2</sup>, Takahashi, R.<sup>\*1</sup>, Oka, S.<sup>\*2</sup>, Nagata, S.<sup>\*2</sup>, Yoshihara, M.<sup>\*3</sup>, Chayama, K.<sup>\*1</sup>, Shimamoto, F.<sup>\*4</sup>, Haruma, K.<sup>\*5</sup> (<sup>\*1</sup>Dept. of First internal medicine, <sup>\*2</sup>Dept. of Endoscopy, <sup>\*3</sup>Health Service Center, <sup>\*4</sup>Dept. of Pathology <sup>\*5</sup>Division of Gastroenterology, Kawasaki Medical School): Curable conditions after endoscopic mucosal resection for rectal carcinoid tumor - in relation to analysis of cases followed up in long-term post treatment. *Early Colorectal Cancer* **6**, 213-222, 2002

## B. Meeting Presentations

1. Yoshida, S., Haruma, K.<sup>\*1</sup>, Tanaka, S.<sup>\*2</sup>, Mitsuoka, Y.<sup>\*3</sup>, Nakamura, K.<sup>\*3</sup>, Okanobu, H.<sup>\*3</sup>, Manabe, N.<sup>\*3</sup>, Kusunoki, H.<sup>\*3</sup>, Hata, J.<sup>\*3</sup>, Kitadai, Y.<sup>\*3</sup>, Yoshihara, M.<sup>\*4</sup>, Chayama, K.<sup>\*3</sup> (\*<sup>1</sup>Division of Gastroenterology, Kawasaki Medical School, \*<sup>2</sup>Dept. of Endoscopy, \*<sup>3</sup>Dept. of First internal medicine, \*<sup>4</sup>Health Service Center): Endoscopic ultrasonography for follow-up in patients with gastric mucosa-associated lymphoid tissue (MALT) lymphoma treated medically. DDW, San Francisco, 2002
2. Yoshida, S., Tanaka, S.<sup>\*1</sup>, Nakao, M.<sup>\*2</sup>, Mitsuoka, Y.<sup>\*2</sup>, Hara, M.<sup>\*2</sup>, Hata, J.<sup>\*2</sup>, Kitadai, Y.<sup>\*2</sup>, Sumii, M.<sup>\*2</sup>, Yoshihara, M.<sup>\*3</sup>, Chayama, K.<sup>\*2</sup>, Hayakawa, N., Haruma, K.<sup>\*4</sup> (\*<sup>1</sup>Dept. of Endoscopy, \*<sup>2</sup>Dept. of First internal medicine, \*<sup>3</sup>Health Service Center, \*<sup>4</sup>Division of Gastroenterology, Kawasaki Medical School): Determination of early gastric cancer depth by endoscopic ultrasonography: indication for endoscopic mucosal resection. Therapeutic Endoscopy, Hong Kong, 2002
3. Yoshihara, M.<sup>\*1</sup>, Tanaka, S.<sup>\*2</sup>, Yoshida, S. (\*<sup>1</sup>Health Service Center \*<sup>2</sup>Dept. of Endoscopy): Effectiveness and economy evaluation of the cancer surveillance. Effectiveness and evaluation of gastric cancer surveillance by the pepsinogen method. Japanese Association for cancer detection and diagnosis, Tokyo, 2002
4. Yoshihara, M.<sup>\*1</sup>, Ito, M.<sup>\*1</sup>, Yoshida, S., Tanaka, S.<sup>\*2</sup>, Kunihiro, M.<sup>\*2</sup>, Nagata, S.<sup>\*2</sup>, Oka, S.<sup>\*2</sup>, Kim, S.<sup>\*3</sup>, Masuda, H.<sup>\*3</sup>, Hayakawa, N., Kamada, T.<sup>\*3</sup>, Kusunoki, H.<sup>\*3</sup>, Haruma, K.<sup>\*4</sup> (\*<sup>1</sup>Health Service Center, \*<sup>2</sup>Dept. of Endoscopy, \*<sup>3</sup>Dept. of First internal medicine, \*<sup>4</sup>Division of Gastroenterology, Kawasaki Medical School): Follow up of 10years of the serum pepsinogen and evaluation of pepsinogen method. JSGMS, Yokohama, 2002
5. Hiyama, T.<sup>\*1</sup>, Yoshihara, M.<sup>\*1</sup>, Egi, Y.<sup>\*2</sup>, Kuroda, T.<sup>\*2</sup>, Kim, S.<sup>\*2</sup>, Masuda, H.<sup>\*2</sup>, Sasaki, A.<sup>\*2</sup>, Kai, H.<sup>\*2</sup>, Yoshida, S., Ito, M.<sup>\*1</sup>, Kitadai, Y.<sup>\*2</sup>, Sumii, M.<sup>\*2</sup>, Tanaka, S.<sup>\*3</sup>, Chayama, K.<sup>\*2</sup> (\*<sup>1</sup>Health Service Center, \*<sup>2</sup>Dept. of First internal medicine): On the result of pepsinogen method as regional gastric cancer surveillance. JSGMS, Hofu, 2002
6. Hara, M.<sup>\*1</sup>, Hata, J.<sup>\*1</sup>, Kamino, D.<sup>\*2</sup>, Nakao, M.<sup>\*1</sup>, Mitsuoka, Y.<sup>\*1</sup>, Kunihiro, K.<sup>\*1</sup>, Okanobu, H.<sup>\*1</sup>, Manabe, N.<sup>\*1</sup>, Nagata, S.<sup>\*2</sup>, Yoshida, S., Kusunoki, H.<sup>\*1</sup>, Tanaka, S.<sup>\*2</sup>, Haruma, K.<sup>\*3</sup>, Chayama, K.<sup>\*1</sup> (\*<sup>1</sup>Dept. of First internal medicine, \*<sup>2</sup>Dept. of Endoscopy, \*<sup>3</sup>Division of Gastroenterology, Kawasaki Medical School): Report of a case. Usefulness of transabdominal ultrasonography by using ADF (advanced dynamic flow) in determination of early gastric cancer. JSUM, yamaguchi, 2002
7. Kamino, D.<sup>\*1</sup>, Hata, J.<sup>\*2</sup>, Ishitobi, T.<sup>\*2</sup>, Nakao, M.<sup>\*2</sup>, Mitsuoka, Y.<sup>\*2</sup>, Kunihiro, K.<sup>\*2</sup>, Hara, M.<sup>\*2</sup>, Okanobu, H.<sup>\*2</sup>, Manabe, N.<sup>\*2</sup>, Kido, T.<sup>\*2</sup>, Yoshida, S., Kusunoki, H.<sup>\*2</sup>, Tanaka, S.<sup>\*1</sup>, Haruma, K.<sup>\*3</sup>, Chayama, K.<sup>\*2</sup> (\*<sup>1</sup>Dept. of Endoscopy, \*<sup>2</sup>Dept. of First internal medicine, \*<sup>3</sup>Division of Gastroenterology, Kawasaki Medical School): Report of a case. Venous sclerotic colitis. JSUM, yamaguchi, 2002
8. Nakao, M.<sup>\*1</sup>, Hata, J.<sup>\*1</sup>, Kamino, D.<sup>\*2</sup>, Mitsuoka, Y.<sup>\*1</sup>, Kunihiro, K.<sup>\*1</sup>, Hara, M.<sup>\*1</sup>, Okanobu, H.<sup>\*1</sup>, Manabe, N.<sup>\*1</sup>, Kido, T.<sup>\*1</sup>, Yoshida, S., Kusunoki, H.<sup>\*1</sup>, Tanaka, S.<sup>\*2</sup>, Haruma, K.<sup>\*3</sup>, Chayama, K.<sup>\*1</sup> (\*<sup>1</sup>Dept. of First internal medicine, \*<sup>2</sup>Dept. of Endoscopy, \*<sup>3</sup>Division of Gastroenterology, Kawasaki Medical School): Evaluation of transabdominal ultrasonography gastric cancer staging. JSUM, yamaguchi, 2002
9. Kunihiro, K.<sup>\*1</sup>, Hata, J.<sup>\*1</sup>, Nakao, M.<sup>\*1</sup>, Kamino, D.<sup>\*2</sup>, Mitsuoka, Y.<sup>\*1</sup>, Hara, M.<sup>\*1</sup>, Okanobu, H.<sup>\*1</sup>, Manabe, N.<sup>\*1</sup>, Yoshida, S., Kusunoki, H.<sup>\*1</sup>, Tanaka, S.<sup>\*2</sup>, Haruma, K.<sup>\*3</sup>, Chayama, K.<sup>\*1</sup> (\*<sup>1</sup>Dept. of First internal medicine, \*<sup>2</sup>Dept. of Endoscopy, \*<sup>3</sup>Division of Gastroenterology, Kawasaki Medical School): Report of a case. Diagnosis of small intestinal malignant lymphoma by transabdominal ultrasonography. JSUM, yamaguchi, 2002
10. Tanaka, S.<sup>\*1</sup>, Yoshida, S., Okanobu, H.<sup>\*1</sup>, Oka, S.<sup>\*1</sup>, Manabe, N.<sup>\*2</sup>, Nagata, S.<sup>\*1</sup>, Hiyama, T.<sup>\*2</sup>, Ito, M.<sup>\*1</sup>, Kitadai, Y.<sup>\*2</sup>,

- Sumii, M.<sup>\*2</sup>, Yoshihara, M.<sup>\*3</sup>, Chayama, K.<sup>\*2</sup> (\*<sup>1</sup>Dept. of Endoscopy, \*<sup>2</sup>Dept. of First internal medicine, \*<sup>3</sup>Health Service Center): Clinical usefulness of high-frequency ultrasound probes (HFUP) for new invasion depth diagnosis in sub-mucosal colorectal carcinoma. International Symposium On Endoscopic Ultrasonography, New York, 2002
11. Hara, M.<sup>\*1</sup>, Hata, J.<sup>\*1</sup>, Haruma, K.<sup>\*1</sup>, Okanobu, H.<sup>\*1</sup>, Mitsuoka, Y.<sup>\*1</sup>, Kayoko, K.<sup>\*1</sup>, Nakamura, K.<sup>\*1</sup>, Manabe, N.<sup>\*1</sup>, Yoshida, S., Kusunoki, H.<sup>\*1</sup>, Ito, M.<sup>\*2</sup>, Kitadai, Y.<sup>\*1</sup>, Sumii, M.<sup>\*1</sup>, Tanaka, S.<sup>\*2</sup>, Yoshihara, M.<sup>\*3</sup>, Chayama, K.<sup>\*1</sup> (\*<sup>1</sup>Dept. of First internal medicine, \*<sup>2</sup>Dept. of Endoscopy, \*<sup>3</sup>Health Service Center): Impaired fundic accommodation seen in functional dyspepsia. UEGW, Switzerland, 2002
  12. Hara, M.<sup>\*1</sup>, Hata, J.<sup>\*1</sup>, Nakao, M.<sup>\*1</sup>, Kamino, D.<sup>\*2</sup>, Mitsuoka, Y.<sup>\*1</sup>, Kunihiro, K.<sup>\*1</sup>, Nakamura, K.<sup>\*1</sup>, Okanobu, H.<sup>\*1</sup>, Manabe, N.<sup>\*1</sup>, Yoshida, S., Kunihiro, M.<sup>\*1</sup>, Ito, M.<sup>\*2</sup>, Kitadai, Y.<sup>\*1</sup>, Sumii, M.<sup>\*1</sup>, Tanaka, S.<sup>\*2</sup>, Yoshihara, M.<sup>\*3</sup>, Kusunoki, H.<sup>\*4</sup>, Haruma, K.<sup>\*4</sup>, Chayama, K.<sup>\*1</sup> (\*<sup>1</sup>Dept. of First internal medicine, \*<sup>2</sup>Dept. of Endoscopy, \*<sup>3</sup>Health Service Center \*<sup>4</sup>Division of Gastroenterology, Kawasaki Medical School): Impaired fundic accommodation seen in functional dyspepsia. JSGE, Yokohama, 2002
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