

## Summary

### Performance Profile of FDG-PET and PET/CT for Cancer Screening Based on a Japanese Nationwide Survey

Ryogo MINAMIMOTO<sup>\*1</sup>, Michio SENDA<sup>\*2</sup>, Kimiichi UNO<sup>\*3</sup>, Seishi JINNOUCHI<sup>\*4</sup>, Takeshi INUMA<sup>\*5</sup>,  
Kengo ITO<sup>\*6</sup>, Chio OKUYAMA<sup>\*7</sup>, Kazuhiro OGUCHI<sup>\*8</sup>, Masami KAWAMOTO<sup>\*9</sup>,  
Yutaka SUZUKI<sup>\*10</sup>, Eriko TSUKAMOTO<sup>\*11</sup>, Takashi TERAUCHI<sup>\*12</sup>, Rumi NAKASHIMA<sup>\*13</sup>,  
Masami NISHIO<sup>\*14</sup>, Sadahiko NISHIZAWA<sup>\*15</sup>, Hiroshi FUKUDA<sup>\*16</sup>,  
Tsuyoshi YOSHIDA<sup>\*17</sup> and Tomio INOUE<sup>\*1</sup>

<sup>\*1</sup>*Department of Radiology, Graduate School of Medicine, Yokohama City University*

<sup>\*2</sup>*Division of Molecular Imaging, Institute of Biomedical Research and Innovation*

<sup>\*3</sup>*Nishidai Clinic Diagnostic Imaging Center*

<sup>\*4</sup>*Atsuchi Memorial Institute of Radiology, Atsuchi Memorial Clinic PET Center*

<sup>\*5</sup>*National Institute of Radiological Sciences*

<sup>\*6</sup>*Department of Brain Science and Molecular Imaging, National Institute for Longevity Sciences,  
National Center for Geriatrics and Gerontology*

<sup>\*7</sup>*Department of Radiology, Graduate School of Medical Science, Kyoto Prefectural University of Medicine*

<sup>\*8</sup>*Positron Imaging Center, Aizawa Hospital*

<sup>\*9</sup>*Yuai Clinic, Diagnostic Imaging Center, Radiology*

<sup>\*10</sup>*HIMEDIC Imaging Center at Lake Yamanaka*

<sup>\*11</sup>*Medical Cooperation Teishinkai Central CI Clinic*

<sup>\*12</sup>*Cancer Screening Division, Research Center for Cancer Prevention and Screening, National Cancer Center*

<sup>\*13</sup>*Japanese Red Cross Kumamoto Health Care Center*

<sup>\*14</sup>*Department of Radiology, Nagoya PET Imaging Center*

<sup>\*15</sup>*Hamamatsu Medical Imaging Center, Hamamatsu Medical Photonics Foundation*

<sup>\*16</sup>*Department of Nuclear Medicine and Radiology, Institute of Development, Aging and Cancer, Tohoku University*

<sup>\*17</sup>*Department of Radiology, Koga Hospital 21 PET Center*

A total of 50,558 healthy subjects underwent an FDG-PET (including PET/CT) scan with or without combination of other tests for cancer screening in 46 PET centers during fiscal year of 2005 in Japan. Thorough examination was indicated for 9.8% of the cases due to positive findings suggesting possible cancer. On analyzing 43,996 cases from 38 PET centers, where detailed information was obtained, 500 cases of cancers (1.14%) were found, of which 0.90% was PET positive and 0.24% was PET negative, resulting in the

relative sensitivity of PET being 79.0%. Cancers of thyroid, colon/rectum, lung and breast were most frequently found (107, 102, 79, 35 cases, respectively) with high PET sensitivity (88%, 90%, 80%, 92%). PET showed an overall positive predictive value of 29.0%. PET/CT had better detection rate, sensitivity, and positive predictive value than dedicated PET ( $p < 0.01$ ).

**Key words:** FDG, PET, PET/CT, Cancer screening.