

Progress report 2015

## Department of Joint Disease Research

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### Brief Summary

**Introduction and Organization:** The department of Joint Disease Research was established in 22<sup>nd</sup> Century Medical and Research Centre in 2005; it is an endowment department supported by Chugai Pharmaceutical Co., Ltd. and in close collaboration with the department of Orthopaedic Surgery. Our department has been established for epidemiological studies to clarify the frequencies of and risk factors for musculoskeletal diseases.

**Research Activities:** Musculoskeletal diseases, including osteoarthritis (OA) and osteoporosis (OP), are major public health problems among the elderly that affect their activities of daily living (ADL) and quality of life (QOL), leading to increased morbidity and mortality. Because of the growing aging population in Japan, a comprehensive and evidence-based strategy for the prevention of diseases of bone and joint system, including OA and OP, is urgently required. However, only a few prospective longitudinal studies have been undertaken thus far, and little

information is available on the prevalence and incidence of OA and OP as well as pain and disability in the Japanese population. It is difficult to design rational clinical and public health approaches for the diagnosis, evaluation, and prevention of OA and OP without such epidemiological data.

We, therefore, established a large-scale nationwide OA/OP cohort study titled Research on Osteoarthritis/osteoporosis against Disability (ROAD), which consisted of 3,040 participants in 3 communities located in the urban, mountainous, and coastal areas (baseline study) of Japan between 2005 and 2007. Following the baseline study, a second survey was performed in the same communities between 2008 and 2010, comprising of 2,674 inhabitants. The third survey has completed in 2013, and forth survey started in 2015.

In addition, we have developed several computer programs for completely automatic measurement of the major parameters of OA and OP for multimodality medical image analysis.

## Publication

### Original Articles

1. Yoshimura N, Muraki S, Oka H, Nakamura K, Kawaguchi H, Tanaka S, Akune T: Serum levels of 25-hydroxyvitamin D and occurrence of musculoskeletal diseases, such as osteoporosis, knee osteoarthritis and lumbar spondylosis: A three-year follow-up of the road study. *Osteoporos Int* 26:151–161, 2015
2. Yoshimura N, Akune T, Fujiwara S, Shimizu Y, Yoshida H, Nishiwaki Y, Sudo A, Omori G, Yoshida M, Shimokata H, Suzuki T, Muraki S, Oka H, Nakamura K: Incidence of disability and its associated factors in Japanese men and women: The Longitudinal Cohorts of Motor System Organ (LOCOMO) study. *J Bone Miner Metab* 33: 186-191, 2015
3. Kagotani R, Yoshida M, Muraki S, Oka H, Hashizume H, Yamada H, Enyo Y, Nagata K, Ishimoto Y, Teraguchi M, Tanaka S, Nakamura K, Kawaguchi H, Akune T, Yoshimura N: Prevalence of diffuse idiopathic skeletal hyperostosis (DISH) of whole spine and its association with lumbar spondylosis and knee osteoarthritis: The ROAD Study. *J Bone Miner Metab* 33: 221-229, 2015
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5. Yoshimura N, Muraki S, Oka H, Tanaka S, Kawaguchi H, Nakamura K, Akune T: Mutual associations among musculoskeletal diseases and metabolic syndrome components: A 3-year follow-up of the ROAD study. *Mod Rheumatol* 25:38-48, 2015
6. Muraki S, Akune T, Ishimoto Y, Nagata K, Yoshida M, Tokimura F, Tanaka S, Oka H, Kawaguchi H, Nakamura K, Yoshimura N: Does osteophytosis at the knee predict health-related quality of life decline? A 3-year follow-up of the ROAD study. *Clin Rheumatol* 34: 1589-1597, 2015
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8. Mure K, Yoshimura N, Hashimoto M, Muraki S, Oka H, Tanaka S, Kawaguchi H, Nakamura K, Akune T, Takeshita T: Urinary 8-iso-prostaglandin F2a as a marker of metabolic risks in the general Japanese Population: The ROAD Study. *Obesity* 23,1517-1524, 2015
9. Ogata T, Muranaga S, Ishibashi H, Ohe T, Izumida R, Yoshimura N, Iwaya T, Nakamura K: Development of a screening program to assess motor function in the adult population: A cross-sectional observational study. *J Orthop Sci* 20: 888-895, 2015
10. Yoshimura N, Musaki S, Oka H, Tanaka S, Ogata T, Kawaguchi H,

- Akune T, Nakamura K: Association between new indices in the locomotive syndrome risk test and decline in mobility: third survey of the ROAD study. *J Orthop Sci* 20:896-905, 2015
11. Yoshimura N, Muraki S, Oka H, Nakamura K, Kawaguchi H, Tanaka S, Akune T: Factors affecting changes in the serum levels of 25-hydroxyvitamin D: A 3-year follow-up of the ROAD study. *Osteoporos Int* 26:151-161, 2015
  12. Muraki S, Akune T, Teraguchi M, Kagotani R, Asai Y, Yoshida M, Tokimura F, Tanaka S, Oka H, Kawaguchi H, Nakamura K, Yoshimura N: Quadriceps muscle strength, radiographic knee osteoarthritis and knee pain: the ROAD study. *BMC Musculoskelet Disord* 2015 Oct 16; 16: 305
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  14. Iidaka T, Muraki S, Akune T, Oka H, Kodama R, Tanaka S, Kawaguchi H, Nakamura K, Yoshimura N: Prevalence of radiographic hip osteoarthritis and its association with hip pain in Japanese men and women: The ROAD study. *Osteoarthritis Cartilage* 24:117-123, 2016
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