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## **The 465th International Symposium on Therapy**

The 465th International Symposium on Therapy was held at the Kioi Forum in Tokyo on July 18, 2024. Dr. Taro Kondo, Managing Director of the International Medical Society of Japan (IMSJ), presided over the meeting.

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T. Kondo, MD. Managing Director, IMSJ

### **■ Discourse**

#### **Housing and living styles to expand healthy life expectancy**

Toshiharu Ikaga  
Professor Emeritus, Keio University, PhD  
President, Institute for Built Environment and Carbon Neutral for SDGs

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Koutaro Yokote MD, PhD, MBA  
President, Chiba University



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# Obesity Update

## ■ Introductory Message from the Chair

**T. Kondo, MD**  
**Managing Director, IMSJ**

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## Discourse

### **Housing and living styles to expand healthy life expectancy**

**Toshiharu Ikaga**  
**Professor Emeritus, Keio University, PhD**  
**President, Institute for Built Environment and Carbon Neutral for SDGs**

#### 1. WHO Recommendations and Health Japan 21 (Third Edition)

World Health Organization published the WHO Housing and Health Guidelines in November 2018, recommending countries to keep the minimum winter room temperature at 18 °C or higher, to insulate housing at new construction or renovation and take measures against heatstroke in summer. In response to this, Japan has revised the Basic Plan for Housing (Cabinet decision in March 2021), amended the Act on Promotion of Housing Quality Assurance to create insulation grades up to 7 (promulgated in March 2022), amended the Act on Improvement of Energy Consumption Performance of Buildings to make it mandatory to comply with energy conservation standards when building new homes (promulgated in June 2022), and enhanced subsidies, tax incentives, and loans for energy conservation measures in homes. In addition, Health Japan 21 (Third Edition), announced by the Minister of Health, Labor and Welfare in May 2023, for the first time clearly states that "it is necessary to actively cooperate with efforts in the fields of building and housing sector. "

#### 2. Findings gained from surveys of before and after home insulation renovation

The research study referenced as the basis for the above is the "Smart Wellness Housing Promotion Project Survey (hereinafter referred to as the SWH Survey)" launched in fiscal year 2014 by the Ministry of Land, Infrastructure, Transport and Tourism in collaboration with the Ministry of Health, Labor and Welfare. The author serves as the secretary of a committee consisting of about 90 medical and architectural experts and as the chairman of the Survey and Analysis Subcommittee. A nationwide survey of 2,000

households and 4,000 people on the impact of improving housing through housing insulation renovation and other measures on residents' health was conducted, and as of July 2024, 13 original medical papers (1)-(13) and one review paper (14) have been published. 90% of homes do not meet the WHO recommendation of 18 °C, and there is a maximum difference of 6.7 °C in the average room temperature in the living room at home by 46 prefectures excluding the subtropical Okinawa Prefecture (Hokkaido 19.8 °C, Kagawa 13.1 °C). It is in warm regions, not cold regions, where the room temperature is low, and where energy-saving standard-compliant homes are not widespread, that insulation renovation is particularly needed. Furthermore, based on the original paper, the paper has become an explanatory paper stating that high blood pressure and cardiovascular diseases, which have been widely recognized as "living style-related diseases," can also be "living style-related diseases" caused by the thermal environment of the home.

(1) 90% of homes have a temperature below the WHO recommended 18 °C, and the lower the temperature, the more likely it is to be in a warm climate, live alone, or have a low income (Indoor Air 2020)

(2) The average temperature difference between the living room, bedroom, and dressing room was 4 °C, and the temperature difference between the top and bottom of the living room and between morning and evening was about 3 °C. Elderly people, who are more susceptible to health damage caused by the cold, did not feel the cold as much (Env Int. 2024).

(3) Developing an estimation model for morning systolic blood pressure based on age, gender, lifestyle, and room temperature (Hypertens. 2019)

(4) Daily and day-to-day variation in home blood pressure is significantly greater in homes with unstable room temperature (Hypertens Res. 2021)

(5) After insulation renovation, the average morning systolic blood pressure decreased by 3.1 mm, which is equivalent to the blood pressure reduction target of 4 mm set by Health Japan 21 (J Hypertens. 2020)

(6) People with abnormal electrocardiogram findings were 2.2 times more likely to live in homes with an average living room temperature of less than 12 °C compared to those with an average room temperature of 18 °C or higher (Environ Health Prev Med. 2021)

(7) People with blood lipids exceeding the standard value were 1.6 times more likely to live in homes with average living room temperatures below 12 °C than those with average living room temperatures above 18 °C (J Atheroscler Thromb. 2022)

(8) People with overactive bladder symptoms are 1.4 times more likely to live in homes with a living room temperature of less than 12 °C before bedtime than those with a room temperature of 18 °C or higher (Urology 2020)

(9) Sleep quality is significantly lower in homes with cold and dry bedrooms (Nagoya J.

Med. Sci. 2021)

(10) Health-related QOL (SF8 physical and mental summary scores) is significantly lower in homes with poor room temperature, noise, lighting, hygiene, safety, and crime prevention performance (Indoor Air 2021)

(11) Sedentary time in the home is significantly longer and physical activity is significantly lower in cold homes where people have no choice but to rely on kotatsu (heated table) (Exercise Epidemiology Study 2021)

(12) Sedentary time in the home was significantly reduced by improving room temperature in non-occupied rooms through insulation renovations, and physical activity levels were also significantly increased (Exercise Epidemiology Study 2023)

(13) Falls occurring at home more than twice a year are 2.9 times more likely in homes where the room temperature near the living room floor is below 12 °C compared to 18°C or higher (Japan Journal of Geriatrics 2024)

(14) Hypertension and cardiovascular diseases are lifestyle-related as well as environmental diseases [Review paper] (Hypertens Res. 2021)

### 3. Knowledge emerging from a five-year follow-up study of home insulation renovations

The aforementioned SWH survey has been continuing follow-up surveys five years after insulation renovations since fiscal 2020, and the following preliminary results are beginning to be available:

1) In homes where insulation renovations were implemented, the rise in systolic blood pressure upon waking up after five years was reduced by 2.5 mm (blood pressure rise was halved).

2) In homes where the bedroom temperature during sleep was improved to 18 °C or higher after insulation renovation, the incidence of dyslipidemia after five years was reduced by 30%.

3) In homes where the room temperature before bedtime was improved to 18 °C or higher after insulation renovation, the incidence of nocturnal frequent urination was reduced by 40% five years later.

4) In homes where the room temperature 1m above the living room floor was improved to 19 °C or higher and the room temperature near the floor was improved to 16 °C or higher after insulation renovation, the occurrence of tripping and falling after five years was reduced by 50%.

### 4. Findings obtained from cross-sectional and longitudinal surveys targeting frail elderly

In addition, original papers (15)-(19) obtained from JSPS Grant-in-Aid for Scientific Research (S) (17H06151) "Field survey on Impact of living environments on brain, cardiovascular, respiratory and locomotive system, and co-benefit evaluation of disease and long-term care prevention (Principal Investigator: Toshiharu Ikaga)" are summarized

below:

(15) Grip strength of frail elderly people living at home significantly decreases in winter when living in cold conditions (Int J Environ Res Public Health. 2017)

(16) The risk of falls and frailty among frail elderly people living at home is significantly higher in colder homes (Int J Environ Res Public Health. 2019)

(17) The age at which people are certified as requiring nursing care is 77.8 years in cold homes (living room temperature in winter 14.7 °C) and 80.7 years in warm homes (living room temperature in winter 17.0 °C), a difference of 2.9 years (J Environ Eng. 2019).

(18) The risk of developing a higher level of care need after moving into a nursing home is 1.5 times higher in cold facilities than in warm facilities (living room 23±2 °C, private room 20±2 °C), and is 2.0 times higher in overly dry facilities with relative humidity of less than 30% in winter than in those with a relative humidity of 30-50% (J Environ Eng. 2018).

(19) The 10-year probability of developing hypertension is 1.8 times higher in people whose room temperature upon waking is below 13 °C compared to people whose room temperature is above 13 °C (J Environ Eng. 2022)

5. Towards the spread of housing and living styles that contribute to extending healthy life expectancy

The author's latest research results on housing and health have been summarized. Of the 50 million homes in Japan, only 13% meet current energy-saving standards, according to a survey by the Ministry of Land, Infrastructure, Transport and Tourism. We would like to receive the help of the medical society's doctors to promote the insulation renovation of the majority of existing homes, which have major health issues, and to popularize homes and living styles to contribute to extending healthy life expectancies.

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## Lecture I

### **Obesity, physical activity and sedentary behaviour**

**Yuko Oguma, MD, PhD, MPH**  
**Professor, Sports Medicine Research Center**  
**& Graduate School of Health Management, Keio University**

Physical activity and sedentary behavior are a major part of energy expenditure, and in balance with diet (energy intake), people who are less physically active have lower energy expenditure and are more likely to accumulate fat as energy intake exceeds

energy expenditure. Many observational studies have found a negative association between physical activity and obesity. Prolonged sedentary behavior can cause extremely low energy expenditure, leading to obesity. Observational studies have shown a positive correlation between obesity and duration of sedentary behavior. In particular, television viewing time is associated with obesity in both men and women.

The Obesity Treatment Guidelines 2022 relate to physical activity and sedentary behavior, and an increase in daily physical activity, including daily living activities, reduces obesity (Level of evidence: I). The combination of regular physical activity and dietary intervention enhances obesity prevention (Level I). Length of inactive sedentary time is summarized as being associated with weight gain (Level II) (The definition of "level" is as follows. Level of evidence I: data available from randomized controlled trials, large epidemiological studies, or meta-analyses; II: small randomized controlled trials or non-randomized studies available; III: expert consensus or standard of care.) As a treatment, exercise therapy is associated with, lowering the risk of obesity-related death cardiovascular disease incidence and severity, useful in obesity prevention, ineffective in weight loss (all Level I), useful in weight loss weight maintenance, and lowering the risk of cardiovascular disease incidence and severity (all Level II), even if it does not reach the recommended level. Lifestyle intervention studies also recommend that aerobic exercise training, when added to the diet, has a greater effect on abdominal fat loss (Level I) and reduces skeletal muscle mass loss during energy restriction (Level II).

The "Standard Exercise Program" is an exercise program created by the Health and Labor Science Research Program "Grasping the Current Status of Health Promotion Facilities, Development of Standard Exercise Instruction Programs, Verification of Effectiveness, and Dissemination of Awareness" (FY 2017 - FY 2019), and the "Exercise Program for People with Obesity and Metabolic Syndrome" is compiled as a leaflet. The leaflet will be especially useful when introducing the specific programs and points of caution for aerobic exercise and strength training at exercise facilities.

In January of this year, the Ministry of Health, Labor and Welfare (MHLW) released the "Physical Activity and Exercise Guide for Health Promotion 2023. In addition to summarizing recommendations for physical activity and exercise for adults, the elderly, and children, the guide also provides

INFORMATION 1-8 on points to consider in various special situations and settings. The overall direction of the report emphasizes "adjusting the intensity and amount of physical activity based on individual differences and starting with what is possible" and "moving the body as much as possible. For people with chronic diseases, the study group

reviewed hypertension, type 2 diabetes, dyslipidemia, and knee osteoarthritis, and summarized the key points of physical activity (hypertension, type 2 diabetes, dyslipidemia, and knee osteoarthritis) as INFORMATION 3. All of these diseases are often associated with obesity and can be utilized. In addition, key points for safe physical activity and exercise are summarized as INFORMATION 4. Although not limited to obese individuals, exercise-related adverse events tend to occur with high-intensity exercise or when an unfamiliar person suddenly exercises more than usual, and are less likely to occur when light to moderate intensity exercise is performed. Therefore, it is important to carefully check the amount and intensity of usual physical activity and health status, conduct a health check before exercise if necessary, and gradually recommend exercise according to the individual's condition.

In addition to individual approaches, obesity and obesity-related diseases need to be addressed by society as a whole. To this end, systems approaches are attracting attention and are being put into practice in other countries. In the area of physical activity, in 2018, WHO recommended it in its Global Action Plan on Physical Activity 2018-2030. As a social issue, it is necessary to promote a shared vision and actions to address the factors of obesity upstream in a sustained and comprehensive manner, involving stakeholders in the wider system.

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## **Lecture II**

### **Update on the management of obesity**

**Koutaro Yokote MD, PhD, MBA**  
**President, Chiba University**

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