Part I

Oral Frailty

1. Frailty

Introduction: To establish a reliable integrated community care system

Japanese society has already become such a super-ageing society that other countries in the world have never experienced. Rapid progress in ageing of the population is one reason that the ageing of Japanese society is evaluated as "unprecedented in the world"—progress in ageing of the population is evaluated based on the number of years spent until the rate of ageing reaches 14% after the rate exceeds 7% (Figure I-1) [1]. The elderly people aged 65 and over doubled in number during 25 years ranging from 2005 to 2030 in Japan. At the same time, the number of elderly having dementia and living alone has also been increasing dramatically. Now, we are in an age of high mortality. The National Institute of Population and Social Security Research has estimated that 1.65 million people would die in 2039 when the annual death toll in Japan will reach its peak, and death of very elderly people aged 85 or older is highly likely to account for 60% of the death toll [2]. This estimation would be particularly applicable to metropolitan areas. It would be difficult to solve the unprecedented-level ageing population problems that would occur in metropolitan areas in the future with the measures that have been taken to deal with the ageing population problems in regional districts until now.

After the concept of "integrated community care system" was constructed, each region has made efforts toward improving its social system for a long time as a national policy. Under the concept, each municipality is required to think about the measures necessary for its region by itself while considering situations and characteristics of the region and encourageing multi-stakeholders such as administration, professions, and citizens to execute the measures in a united manner. The level of every element subject to the integrated community care system (medical care, long-term care, preventive care, life support service, housing, etc.) should be improved. Now, whether the conventional healthcare policy is appropriate or not is being questioned. We have come to a period when the systems providing medical and long-term care should be improved drastically from a much broader perspective. In that sense, social innovation from multifaceted viewpoints is an urgent task.

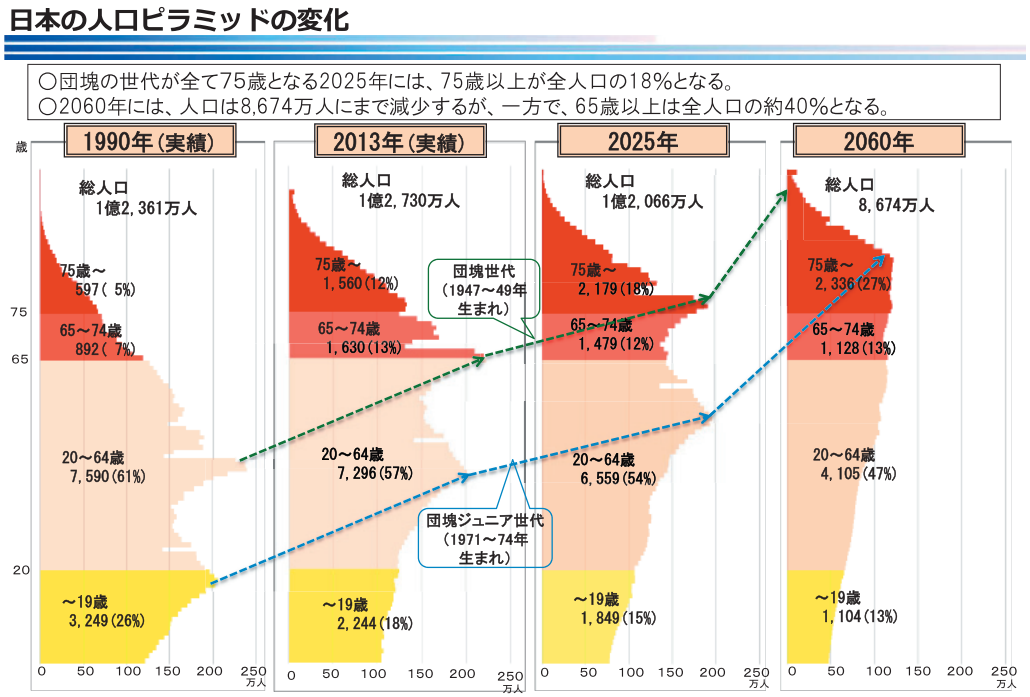

Figure I-1. Transition of the demographic pyramid: from "cavalry-battle" type to "piggyback" type

Source: The Ministry of Internal Affairs and Communications: "National census" and "Estimate of the population," and the National Institute of Population and Social Security Research: "Population Projections" (estimation at the time point of January 2012)
Projection of medium-fertility and medium-mortality (population for October 1st of each year)

Based on the above-mentioned situations, as a forerunner among the countries of longevity, we should think about what Japan should aim for, what types of society Japan can create, as well as what information Japan can provide for a global society. In order to respond to a drastic change in demographics, it is an urgent task to improve the entire social system including social welfare such as medical and long-term care, living environment, social infrastructure, and employment status. For example, by extending the healthy life expectancy and encouraging the elderly to participate in economic activities and community activities, it is possible to create new social systems where the elderly become members supporting our society. In this manner, we should pursue new social systems.

From "Medical care system aimed at healing patients' diseases" to "Medical care system aimed at healing patients' diseases as well as supporting these patients": a paradigm shift

As mentioned above, amid the accelerated change in demographics, systems for supporting the elderly have been shifting from "cavalry-battle type" to "piggyback type": in the cavalry-battle type system, the number of working people supporting an aged person is multiple, while in the piggyback type system, the number is almost one. The structure of diseases has changed significantly with time. An increasing number of patients are suffering from chronic diseases (a clinical condition where a complete cure of the disease is unfeasible) represented by dementia, locomotive syndrome, and frailty which is the focus of the present manual. Medical care is now requested to respond to the needs of times of maintaining the quality of life even in old age and living out his/her life happily. In other words, the conventional "medical care system aimed at healing patients' diseases" should be shifted to the original "medical care system aimed at healing patients' diseases as well as supporting these patients" which is represented by " integrated community care system". Specifically, a medical professional should share the idea of "treating diseases and patients would lead to taking care of individual households, eventually leading to taking care of each community" and create a seamless care system. The collaboration-based conventional medical care system should be graded up to the integration-based medical system so that the medical care system can enter a new second stage.

"Frailty"

With ageing, people slowly become weak due to a gradual decline in mental and physical function. As a result, their daily life independence level gradually decreases and eventually, they go into the status requiring long-term care. To raise public awareness about frailty prevention, in 2014, the Japan Geriatrics Society proposed calling frailty "フレイル (pronunciation: fureiru)" in Japanese (Figure I-2). Frailty is a state featuring the following three conditions:

(1) [State at a midway point] Frailty is a state placed at the midpoint between a healthy status and a status requiring long-term care.
(2) [Reversible state] Patients with frailty can recover their declined function through appropriate intervention by utilizing their spared and residual abilities.
(3) [Multifaceted state] Frailty is a multifaced state indicating not only physical frailty that includes mainly skeletal muscles, but also mental/cognitive frailties and social frailty. Two or more frailties interact with one another and cause a vicious cycle, leading to a decline in the daily life independence level [3].

Linda Fried and others provided a frailty cycle focusing on sarcopenia (a syndrome characterized by loss of skeletal muscle mass) [4]. They showed a vicious frailty cycle caused by sarcopenia: when sarcopenia is slightly worsened, resting metabolism and energy consumption decrease, followed by a decrease in dietary intake leading to malnutrition and weight loss, eventually resulting in further worsening of sarcopenia. Social problems such as isolation, social reclusion, poverty and psycho-psychological problems such as cognitive function dysfunction and depression also significantly affect the progression of sarcopenia. Breaking the vicious cycle as early as possible is a big challenge. Considering the above-mentioned matters comprehensively, there would be a limit to leaving frailty prevention and measures only to medical professionals. Frailty can be prevented in a community developed appropriately.

Based on the above-mentioned ideas, the frailty prevention and measures are gradually entering the realm of national projects. Specifically, frailty measures were included in "Japan's plan for promoting dynamic engagement of all citizens" issued by the National Council for Promoting the Dynamic Engagement of All Citizens at the Prime Minister's Office in 2016. In particular, the plan recommends the reinforcing of frailty prevention activities anew in the fields related to nutrition, oral health, and pharmacology. In addition, the significance of frailty prevention and measures also attracted attention at the Ministry of Health, Labour and Welfare-sponsored "Expert panel for integration of health care service business with preventive long-term care service business for the elderly" held in September 2018. Frailty prevention has thus become one of the national strategies.

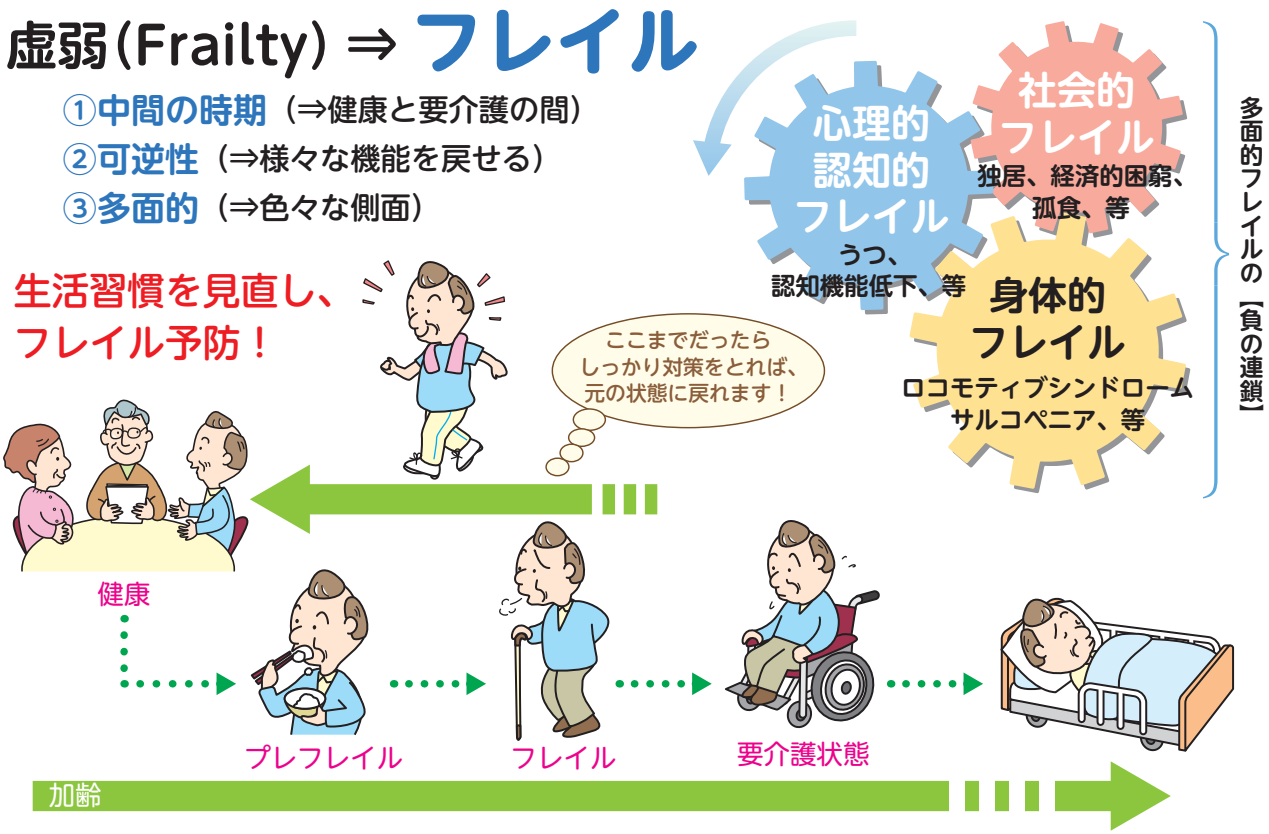

Figure I-2. Frailty

Source: Figure prepared by Dr. Katsuya Iijima. Institute of gerontology, the University of Tokyo

For maintaining the "eating capability" of the elderly

"Eating" is a foundation of human life. It is no exaggeration to say that the center of frailty measures is to prevent sarcopenia. Given these matters, "nutrition" is a key factor for frailty prevention. We sometimes wonder how Japanese people, especially elderly people consider dietary intake. The question arises because not a few late-stage elderly people aged 70 or older in Japan always think that they should lose 2-3 kg. This is probably because they have been conscious of the prevention of metabolic syndrome (or namely, caloric reduction) since they were in their middle age. Therefore, they may highly value losing weight even after they became late-stage elderly people. It is difficult to know which elderly needs to continue caloric reduction and salt restriction in order to strictly manage his/her lifestyle-related disease, or which elderly should switch his/her dietary habit from a diet aimed at metabolic syndrome prevention to a diet aimed at frailty prevention (or namely, taking sufficient calorie). Determining the timing when the elderly switches his/her diet habit to a diet aimed at frailty prevention is also challenging. Switching dietary habits (we call it shifting gears) appropriately would be quite essential to promote frailty measures in the future (Figure I-3).

Eating capability in the elderly is supported by a wide variety of elements related to dental and oral function, such as the number of persistent teeth, chewing force, swallowing function, and occlusal support. The elderly taking multiple drugs (polypharmacy) due to multiple diseases may have appetite loss without their knowledge. Sarcopenia in the whole body including that in the oral cavity affects eating capability. The nutritional condition also has an impact on eating capability: not only bad dietary intake statuses such as unbalanced nutrition but also misunderstanding about diet also affects eating capability. In addition, other factors as follows are also involved in eating capability: sociality (with whom and where the elderly has a meal, etc.), psychological status (presence of cognitive function decline, depression, etc.) and economical status. To allow elderly people to maintain their eating capability, conventional preventive long-term care service businesses developed by individual regions should be further improved, reinforcing activities supporting elderly people (activities related to nutrition, oral care, medication, etc.) should be provided by professionals, and a community based on activities (self-help, cooperation, and mutual aid) considerate to the general people should be created. Each Japanese people should then recognize afresh the significance of the fundamental rule of "chewing well and eating well" as a matter of him/herself. We hope that the "chewing well and eating well" campaign would become a national movement and contribute to the comprehensive improvement of policies related to preventive care.

"Maintaining and improving dental and oral function" is essential for frailty prevention. In a large-scale survey of health in the elderly (longitudinal follow-up cohort study) carried out by the Institute of Gerontology, the University of Tokyo, a broad range of survey items including dental and oral function was subjected to investigation. The survey showed that people having multiple minor declines in oral function tend to newly develop sarcopenia and receive a certification of needed long-term care more frequently: minor declines in oral function indicate declines in the number of persistent teeth, chewing force and tongue pressure, a decline in oral function represented by inarticulateness, and other subjective symptoms such as they cannot eat without spilling food from their mouths, they have a slight choke, and the

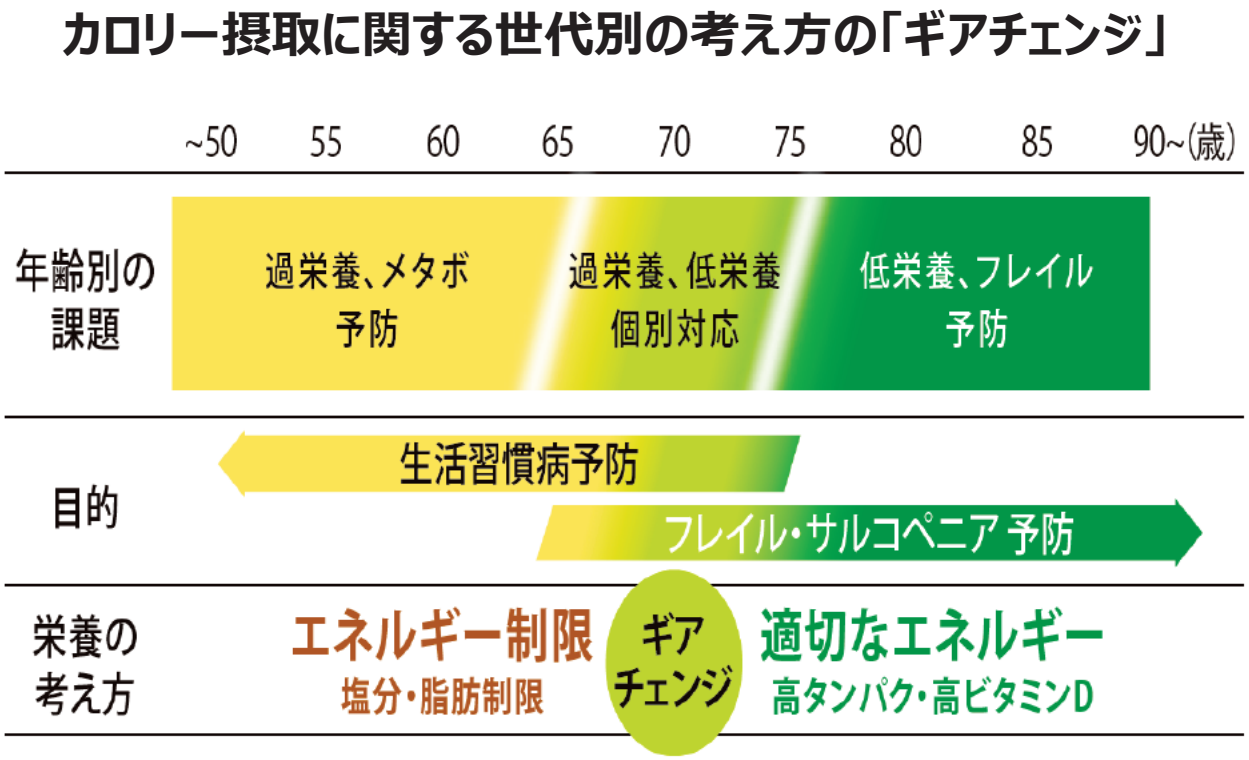

Fig I-3. From metabolic prevention to frailty prevention

Source: Katsuta Iijima (Institute of Gerontology, the University of Tokyo): For everyone engaged in elderly care "Frailty measures sticking to eating", and Masafumi Kuzuya: Nutrition management for the elderly. Japan Medical Journal; 4794: 41-47 (Figure 4 was modified)

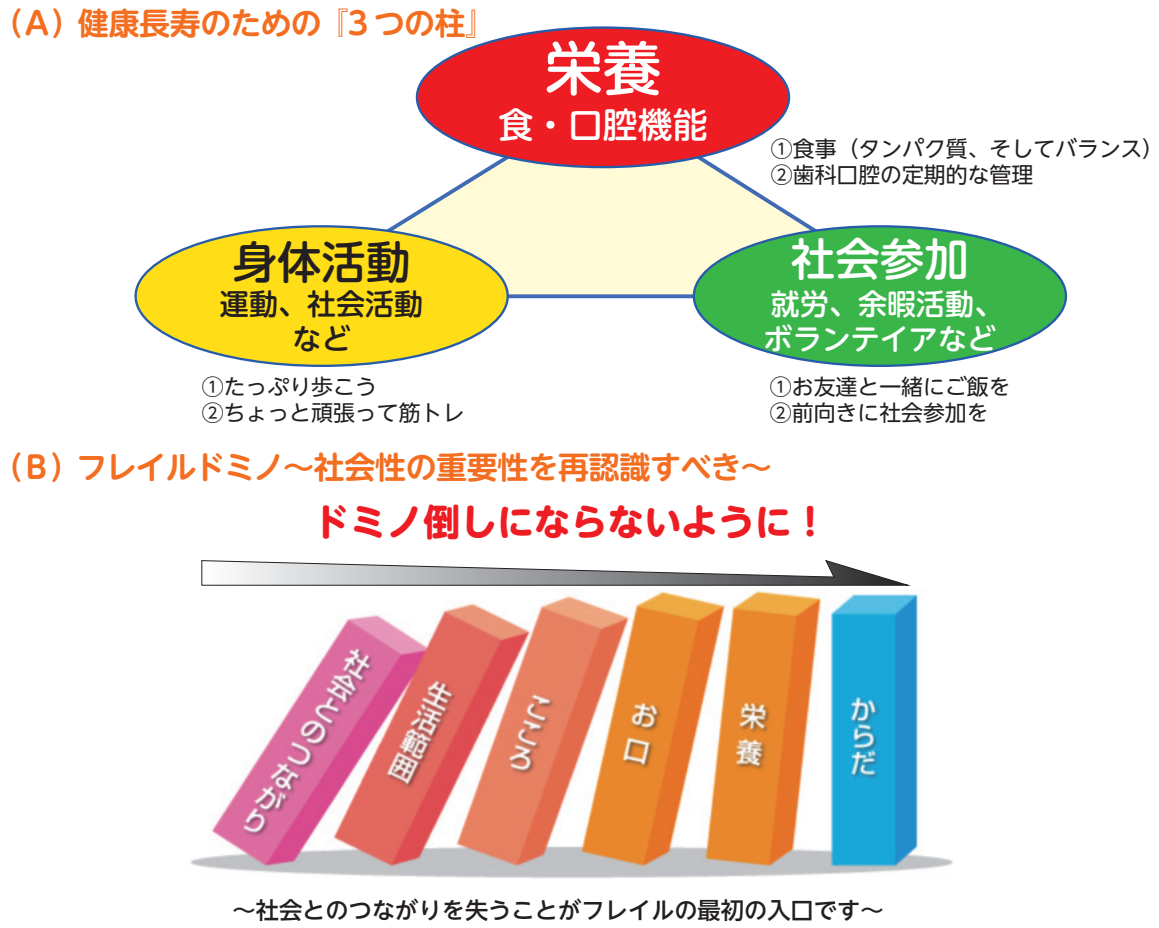

Figure I-4. "Three initiatives" of the measures for achieving healthy longevity and a domino image of frailty

Source: Katsuta Iijima (Institute of Gerontology, the University of Tokyo)

number of foods which they cannot chew has increased compared with before. Multiple minor declines in oral function also raised the total mortality risk significantly. Based on the evidence, we have established a new concept of "oral frailty" (described later) intending to construct a concept of deterioration in health centered on the oral function and raise public awareness about the importance of recognizing minor deterioration of oral function at an early stage [3].

Three initiatives of measures for achieving healthy longevity and frailty prevention: Pursue the three targets in an integrated manner

The results of several studies (the Kashiwa study, etc.) carried out by the Institute of Gerontology, the University of Tokyo and data obtained from the database on about 50 thousand independent elderly people show that "nutrition (diet and oral function), physical activities (exercises, etc.), and social involvement" are the three major initiatives for achieving healthy longevity (frailty prevention). Promoting a change in awareness of individual people is essential so that each person can continuously contribute toward raising the level of the three elements in an integrated and comprehensive manner (Figure I-4A). Figure I-4B shows a domino image of frailty. To deal with the gradual deterioration of our health, the levels of all the above-mentioned three elements should be improved. In particular, what is in question now is how Japanese people should reaffirm the significance of community.

Frailty can be prevented by the better community created by using comprehensive knowledge: From Bench to Community.

Among the frailty measures, measures from a viewpoint of nutrition (diet and oral function) are most essential. Whether effective preventive measures can be developed or not depends on how Japanese people can reaffirm the significance of nutrition which is the origin of our life. The motto of "chewing sufficiently, eating well, taking exercise, having high sociability, and taking part in social activities actively and cheerfully" represents the origin of our life. Communities nationwide should disseminate this motto in an intelligible manner and improve their conventional preventive long-term care service businesses and introduce new frailty prevention activities as measures involving the entire region. The frailty prevention activities would become meaningful activities for the first time when these activities take root in the region and are handed on to the next generation. Even conventional preventive long-term care service businesses started in 2006 still have a lot of tasks to be solved in various activities. For example, in general, professionals have actively intervened in care service for the elderly in the phase just before receiving a certification of needed long-term care. However, for many of those elderly people, even maintaining or improving their existing functions is difficult. Through interprofessional collaboration, reinforcing comprehensive intervention leading to independence support should be provided to those elderly people. It is required to take a stance of "noticing something unusual happening to people at an early stage and accept that as our things." The prevention of oral frailty presented in this manual is placed at the center of nationwide frailty prevention activities.

To create a lively community, elderly people are expected to prolong their individual healthy life expectancies, maintain an independent life without becoming enfeebled as long as possible, and become a bearer of society rather than becoming a care receiver. This is a target not only for individual elderly people but also for our community involving every resident. In that sense, it is not too much to say that Japan is facing a major turning point. In other words, future medical reform will play a major role as part of "community development based on comprehensive knowledge". It is desirable to aim at creating a community familiar to live in and providing well-balanced preventive care and long-term care. Furthermore, a dramatic reform carried out under reliable multi-professional collaboration centered on dentistry, nutrition, and medicine is also required. A critical issue is how to effectively and sustainably achieve the above-mentioned targets with a comprehensive approach while taking account of new and old evidence (From Bench to Community). We are convinced that achieving the targets will eventually lead to "Ageing in Place."

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Oral frailty

Introduction

Oral frailty is a concept giving people a warning not to fall into the negative chain as follows: neglecting slight declines in the mouth and leaving the conditions as they are without taking appropriate measures eventually leads to deterioration of oral function, impairment of eating function, and even deterioration in mental and physical functions. Here, the circumstances in which the concept of oral frailty was proposed are also explained.

The environment surrounding the mouth of the elderly: Context of the development of the concept of oral frailty

Oral frailty means frailty in the mouth. "Weakness" was first used instead of "frailty" as one of the geriatric syndromes. In 2014, the Japan Geriatrics Society proposed to use the word "frailty".

In Japan which has become one of the countries having long life expectancy, not only the length of life but also the quality of life has come to be noticed as essential factors. As a result, "prolongation of healthy life expectancy" has been provided as a goal. Frailty prevention is positioned as a core vision for achieving the goal, and a frailty measures are being developed nationwide (see the previous section for details). Similar to frailty, oral frailty is a concept created amid changes in the need for health care in the elderly represented by an improvement in the achievement rate of the target of the "8020 Campaign".

The achievement rate of the target of the 8020 Campaign, which was introduced in 1989 as one of the activities aimed at maintaining oral health in the elderly, was less than 10% at first, but reached more than 50% in 2016, just 30 years after the start of the campaign. The above-mentioned increase in achievement rate is due to dental treatment effective to eliminate risk factors leading to tooth loss, such as (1) smoking, (2) advanced periodontal disease, (3) poor oral hygiene, and (4) root dental caries. Since the achievement rate of the target of the 8020 Campaign is predicted to continuously increase in the future, in addition to the activities focusing on increasing the number of persistent teeth, the introduction of new activities aimed at maintaining oral health in the elderly has been anticipated. In response to the movement, a new concept of oral frailty focusing on oral function was proposed.

Here, in order to deepen the understanding of the concept of oral frailty, we focus on public activities centered on the oral function which aim to maintain oral health in the elderly. With the goal of prolongation of healthy life expectancy, prevention benefits service was established in 2006 (preventive long-term care service businesses, etc. were also introduced at the same time). As a result, in addition to "prevention of diseases" such as lifestyle-related diseases, "prevention of geriatric syndrome (prevention of dangerous ageing)" was introduced into health promotion activities for the elderly. This was a major turning point where the target of activities was shifted from "disease prevention" aimed at longevity to "healthy longevity." "Oral function improvement service" was introduced as one of the preventive long-term care services (programs). As items for screening of people subject to the oral function improvement service, an interview regarding masticatory function, swallowing function, etc., and evaluations using repetitive salivary swallowing test (RSST) and other tests (see Part III: Assessment of oral frailty) have been applied [6]. This can be regarded as a shift from healthcare activities focused on dental caries, periodontal disease, etc. to healthcare activities related to the oral cavity focused on oral function such as "mastication" and "swallowing". Furthermore, since 2014, dental checkups for late-stage elderly people aged 75 and over have been subjected to national subsidy [7]. The purpose of the dental checkup is "to prevent periodontal disease-related symptoms such as the development of bacterial endocarditis and aggravation of arteriosclerosis, as well as to prevent the development of aspiration pneumonia caused by deterioration of oral function" which is beyond the scope of conventional dental and oral care related businesses (refer to Part III "Health business relevant to oral frailty"). "Maintaining the number of persistent teeth" which is a target of the 8020 Campaign has been a major focus of dental health care for the elderly for a long time. After the above-mentioned changes were applied, the dental checkup has also come to put its major

focus on "prevention of functional decline in the oral cavity."

Amid the popularization of public oral health activities for the elderly, the basic concept of oral frailty was proposed in 2014.

Oral frailty

Herein, we present the concept of oral frailty and the circumstances of its development. The necessity of developing the concept of oral frailty was proposed at the meeting of a working group established for "a study aimed at establishing the concept of ageing syndrome focusing on diet (nutrition) and oral function and developing comprehensive measures for oral care ranging from preventive long-term care (frailty prevention) to oral health care for people in need of long-term care." This study was one of the activities of the 2013 project promoting health in older adults, sponsored by the Ministry of Health, Labour and Welfare [3]. The purpose of establishing the concept of oral frailty was "to allow medical personnel (physicians) and other professionals to easily recognize the importance of maintaining and improving oral function for frailty prevention." This concept was developed by intentionally focusing on "frailty in oral function'' in older adults. Therefore, the aim of developing this concept is to sound an alarm stating that "minor functional decline in the oral region should not be overlooked" at various types of medical and long-term care sites. Our final goal is to coordinate oral frailty prevention, thereby detecting the early signs (trivial signs) which appear before the deterioration of oral function becomes apparent and allowing Japanese people to recognize the significance of the fundamental rule of "walking well, chewing well, and eating well."

Initially, the concept of oral frailty was developed consisting of the following four phases: "social/mental frailty," "nutritional frailty (oral frailty)," "physical frailty," and "severe frailty" [3]. The four-phase concept was developed by referring to Fried's frailty model, a multifaceted model consisting of physical, social, and mental/psychological frailty. After various discussions, the above-mentioned four phases were modified as follows: "first level: decline in oral health literacy," "second level: minor oral problems," "third level: decline in oral function," and "fourth level: impairment of eating function" (Figure I-5). We utilize the above-mentioned "levels" instead of the conventional "phases" to show the stage of frailty in this manual. With this modification, the meaning of each stage was provided. In addition, "diagnostic evaluation for oral hypofunction" was included into the subjects of the FY 2018 Revision of Medical Fee. As a result, the disease name of "oral hypofunction" corresponding to the "third level: decline in oral function" has come to be usable in receipts when insurance medical/dental treatment facilities claim for a medical fee. Details of each level are presented below.

The "first level: decline in oral health literacy" is a stage induced by narrowing a living scope and developing mental instability, followed by a "decline in self-interest in oral function care (oral health literacy)," an essential symptom in this level. As a result, the risk of developing periodontal disease and losing the remaining teeth increases. As people age, the social environment surrounding them may change, and the social roles expected of each person may also change. For example, they are expected to play a role in social communities rather than workplaces. Some may have been isolated on certain occasions. This is known as "social frailty." The "first level: decline in oral health literacy" is the stage at which people lose interest in their health unwittingly because of social frailty or other factors.

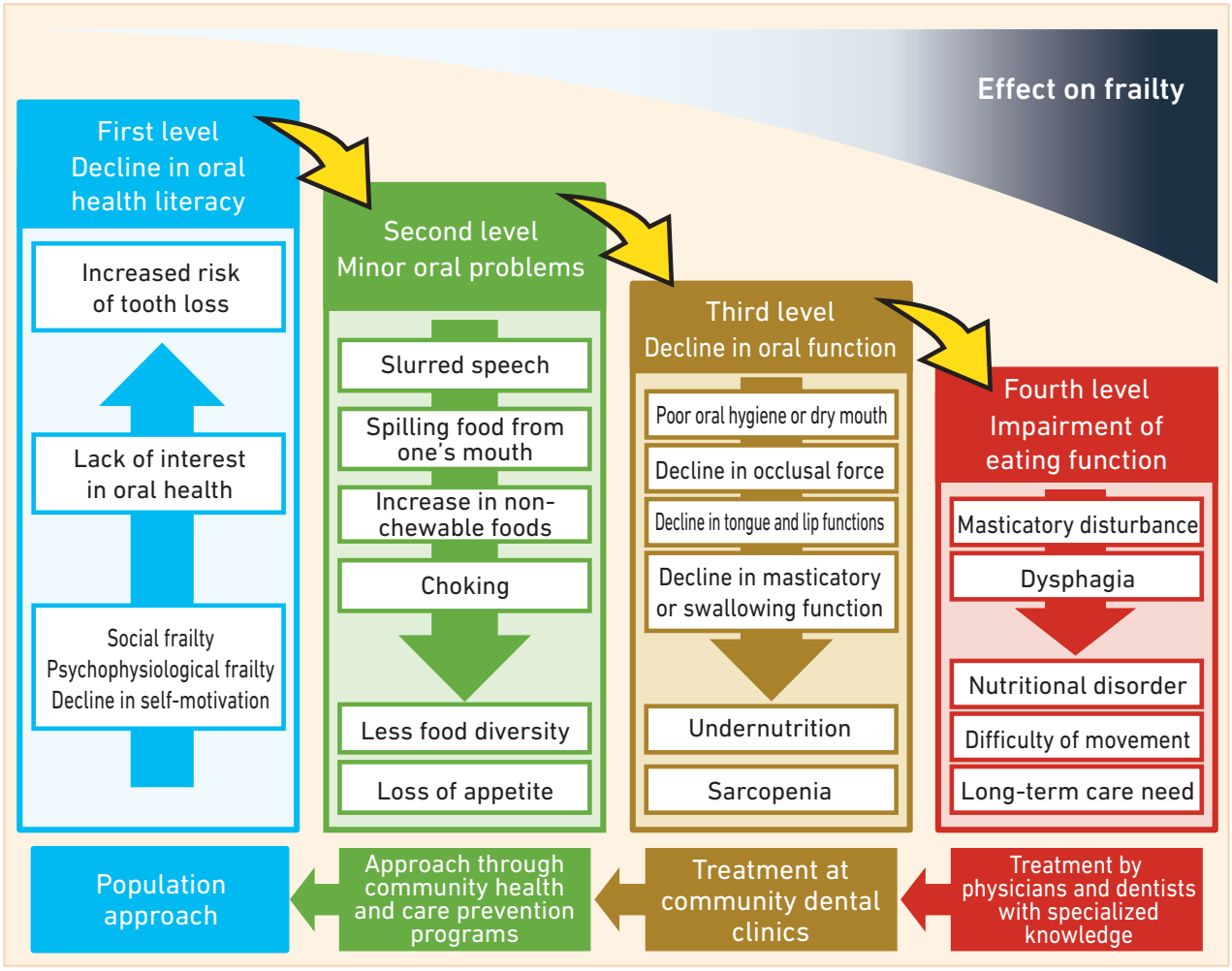

Figure I-5. Concept of Oral Frailty 2019 version

The "second level: minor oral problems" is a stage where signs of environmental deterioration surrounding diet appear in daily life, caused by minor declines in oral function, which appear as subjective symptoms. For example, he/she cannot pronounce clearly, he/she cannot eat without spilling food from his/her mouth, and he/she has a slight choke. Herein, we provide an example for easy understanding of the second level: older adults may think, "I cannot eat tough foods these days. Considering my age, I should eat soft foods and avoid tough ones. Soft foods may be better for digestion." When such a meal choice becomes a habit and is accompanied by functional decline due to ageing, functional decline in the oral cavity may worsen further (Figure I-8). In addition to a decline in oral health literacy (first level), changes in eating habits caused by poor health awareness about the oral cavity, as well as ageing may contribute to a decline in oral function. However, the functional decline is so subtle that older adults hardly become aware of the change, resulting in the stealthy progression of oral functional decline. Since many soft foods are currently available, it may be challenging for older adults to notice a decline in oral function. As a result, many may be aware that the number of foods they cannot chew well increases only after the oral function has deteriorated.

The "third level: decline in oral function" is a stage where a decline in oral function becomes obvious (declines in occlusal force and tongue movement), leading to the development of sarcopenia, locomotive syndrome, and malnutrition. Since some patients at the third level are diagnosed with oral hypofunction, they are treated at dental clinics.

The "fourth level: impairment of eating function" is a stage where the conditions of an older adult who has a decline in swallowing function or masticatory dysfunction change for the worse and gradually develop movement disorder and malnutrition and needs long-term care. A definite diagnosis of a swallowing disorder is made at this stage. Dysphagia rehabilitation, a standardized method for the assessment and treatment of swallowing disorders, is applicable to patients at this stage. Therefore, patients classified at the fourth level are treated by medical doctors, dentists, and others with professional knowledge.

As mentioned above, the concept of oral frailty shows that the effect on frailty, especially physical frailty, becomes more serious as the level of oral frailty advances.

Definition of oral frailty

Negative life events and other factors change the living environment, leading to a decline in oral health awareness, followed by minor oral problems (difficulty speaking smoothly, increased foods that cannot be chewed well, and choking). If these minor oral problems are left untreated, people experience a loss of appetite and decreased food diversity. Oral hypofunction (decline in occlusal force and tongue motility) then occurs, and the risk of developing malnutrition and sarcopenia increases, eventually resulting in impaired eating function. Oral frailty is a series of phenomena and processes. Oral frailty is defined as follows (Figure I-6):

"Oral frailty is a series of phenomena and processes that worsen due to changes in various oral conditions (number of teeth, oral hygiene, and oral function) with ageing, a decline in interest in whole mouth health, and mental/physical residual abilities. Worsened oral frailty causes impairment of eating function and affects frailty, leading to deterioration in mental and physical functions." Therefore, as mentioned previously, oral frailty is a concept that warns people not to fall into the negative chain as follows: neglecting slight functional declines in the oral cavity and leaving the conditions as they do not take appropriate measures eventually results in the deterioration of oral function, impairment of eating function, and deterioration of mental and physical function.

Definition of oral frailty

A series of phenomena and processes that worsen due to changes in various oral conditions (number of teeth, oral hygiene, and oral function) with ageing, a decline in interest in whole mouth health, and mental/physical residual abilities. Worsened oral frailty causes impairment of eating function and affects frailty, leading to deterioration in mental and physical functions.

Figure I-6. Definition of oral frailty

Appropriateness of taking preventive measures for oral frailty

Tanaka et al. conducted a 45-month longitudinal study (Kashiwa Study) with 2,044 older adults living in Kashiwa City, Chiba Prefecture. In this study, six indexes were used to identify the existence of oral frailty. Individuals were diagnosed with oral frailty when a decrease in score was observed for three or more of the six indexes. In this study, the incidence of physical frailty, sarcopenia, and death, and the number of people in need of long-term care were compared between people who showed a decrease in score in none of the six indexes (non-oral frailty group) and those who showed a decrease in score in three or more of the six indexes (oral frailty group). Age, sex, instrumental activities of daily living, body mass index (BMI), cognitive function, depression, residential status, medical history, and the number of medications taken were subjected to statistical adjustment. Even after the statistical adjustment, the incidences of physical frailty and sarcopenia during 2 years were 2.41 and 2.13 times higher in the oral frailty group, respectively. The number of people who received a certification of long-term care needs and the incidence of death during the period of 45 months were 2.35 and 2.09 times higher in the oral frailty group, respectively (Figures I-7, 8) [5].

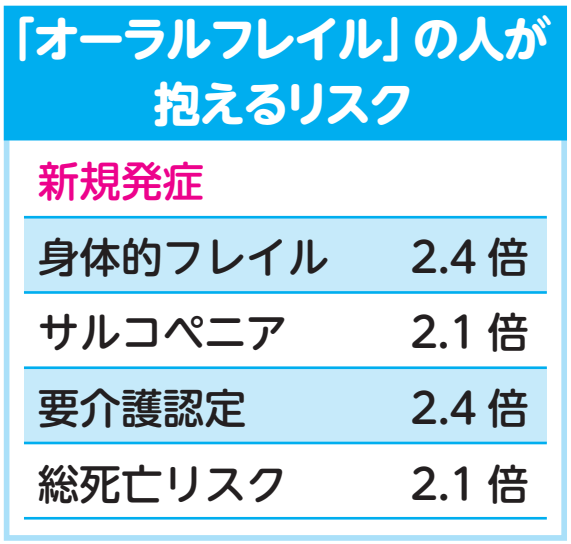

Figure I-7. Epidemiological data on oral frailty 1: Risks assumed by people with oral frailty

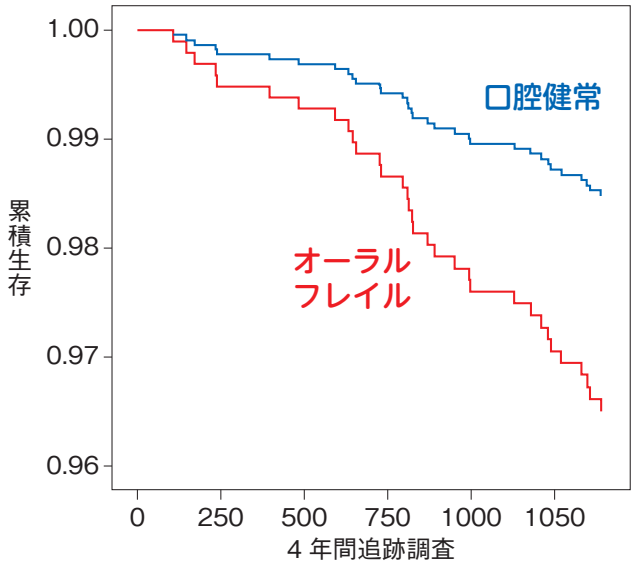

Figure I-8. Epidemiological data on oral frailty 2: Oral frailty and survival rate

According to previous reports, the incidences of frailty, sarcopenia, death, and the need for long-term care are closely related to age, sex, activities of daily living, nutritional status, cognitive function, and other factors. In this study, all these factors were considered when the data were statistically evaluated. Nevertheless, this study showed that a decline in oral function was closely associated with the incidence of frailty, sarcopenia, death, and the need for long-term care. Physical frailty is reported to be associated with mortality and the need for long-term care. This study showed that oral frailty was related to the development of physical frailty and sarcopenia. Therefore, the study results can be regarded as one of the findings objectively showing the risk resulting from leaving minor oral problems (second level), as they do not take appropriate measures.

These results not only suggest that oral frailty occurs prior to systemic frailty and a decline in physical ability but also suggest that oral frailty may impact symptom progression, ranging from the development of frailty and sarcopenia to death, through the status requiring long-term care. The concept of oral frailty suggests that symptoms can improve if appropriate measures are taken at each stage in a timely manner. In particular, at the early stage (first and second levels), older adults are required to incorporate countermeasures for oral frailty into their lives and make efforts to prevent and improve oral frailty while exploring their roles in their living environment, relationships with others, and the community. If none of the appropriate measures were taken at this stage, not only would their oral frailty return to its original state easily, but also leading an independent life would become impossible because various problems arising with ageing affect each other. Countermeasures against oral frailty can ameliorate foul breathing and improve functions related to the oral cavity, such as speech, eating, facial expressions, and appearance, while simultaneously resolving psychophysiological and social problems. Thus, frailty measures are expected to constitute core preventive measures in integrated community care.

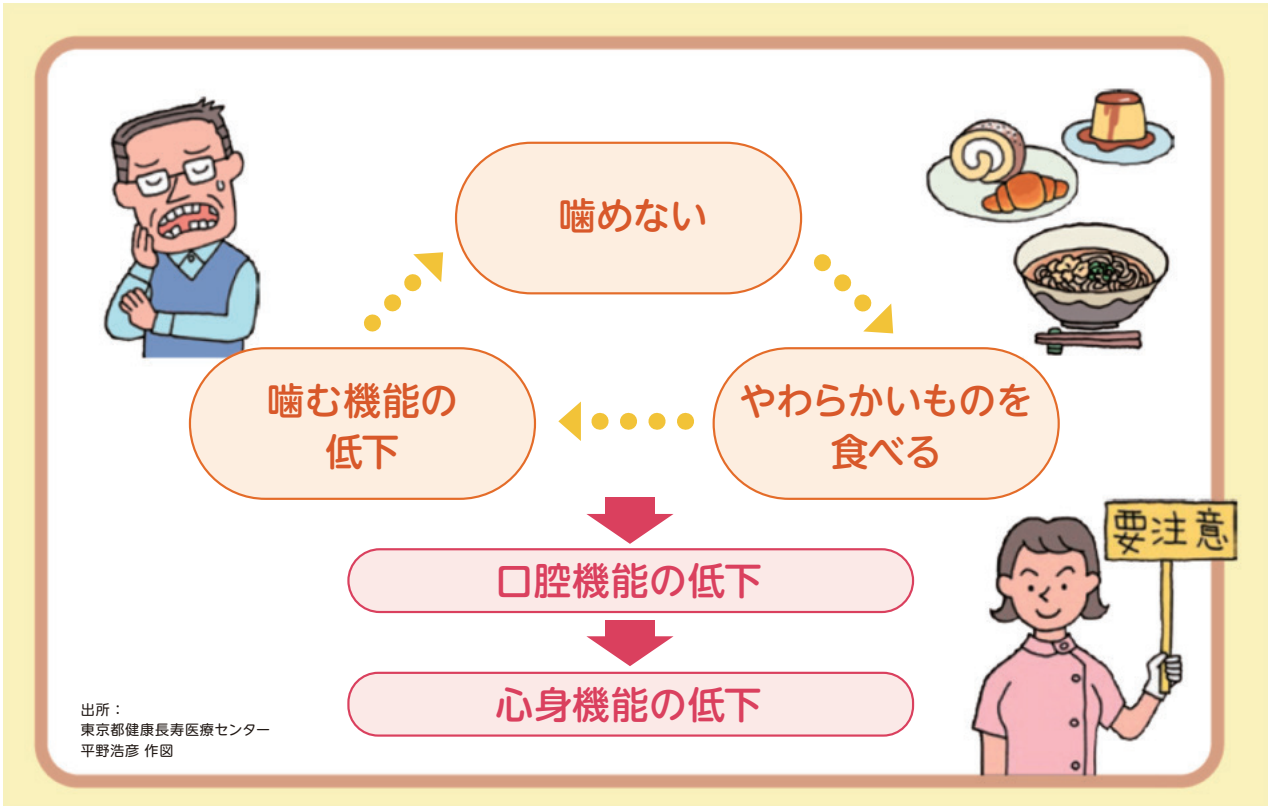

Figure I-9. Vicious circle leading to a decline in oral function

Furthermore, oral frailty measures are essential not only when individuals are healthy or in a state of frailty but also when they need long-term care. Recently, frailty measures have been at the center of policies related to medical welfare in Japan. Considering that the above-mentioned results were obtained from the study on older adults currently in Japan, top priority should be given to oral frailty measures. Therefore, dentists expected to play an important role in frailty measures have a great responsibility.

Significance of development of the concept of oral frailty

The concept of oral frailty was developed to create a model for visualizing the decline in oral function, interpreted as a change caused by ageing and disuse syndrome. Many older adults accept a decline in oral function that progresses with age while saying that the functional decline is attributable to their age and tend to avoid eating tough foods spontaneously, leading to an unwittingly narrowing down of the diversity of their diet. However, if they leave the symptom starting from "minor changes" related to the oral cavity as it is without realizing it, they fall into a vicious cycle of functional decline, resulting in further deterioration in oral function and eventually deterioration in mental and physical functions (Figure I-9). The significance of developing the concept of oral frailty is to enable older adults to recognize such minor changes as a matter of themselves and encourage them to change their behavior [8-10].

Japan has become one of the countries with a long life expectancy because of efforts to prevent lifestyle-related diseases. Recently, not only the length of life but also healthy life expectancy have come to be recognized as essential factors. Amid higher expectations for a prolonged healthy life expectancy, Fried's frailty model has attracted attention,[11] showing that multifaceted problems, such as physical and social, connect and cause functional disorders. Concerns about sarcopenia, on which Fried's frailty model focuses, have also increased. Regarding oral health care in older adults, the infrastructure supporting eating function has been developed through dental care for treating dental caries, periodontal disease, and other dental diseases, while the infrastructure treating disturbances in eating function caused by the aftereffects of a stroke has been developed through dental care and the long-term care insurance

system. After the prevention of functional decline in the oral cavity was reported to significantly contribute to prolonging healthy life expectancy, the disease "oral hypofunction" has become usable when insurance medical/dental treatment facilities claim for a medical fee since 2018. The concept of oral frailty was developed to create a visual model familiar to anyone that would facilitate the advancement of oral health promotion activities for older adults.

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COLUMN What is the difference between oral frailty and a decline in oral function due to ageing?

Ageing is a naturally occurring progressive phenomenon. The symptoms of oral frailty, such as choking and spilling food from one's mouth, indicate the "first step toward physiological ageing." The difference between a natural decline in oral function and oral frailty is that oral frailty is an unnatural decline closely related to social and psychophysiological problems. However, when people are conscious of the importance of preventing oral frailty and appropriate measures are taken, the ageing speed of organs around the oral cavity can be reduced, and oral functions that are being lost can be restored. Conversely, if oral frailty remains untreated, the decline in oral function advances more seriously and quickly than the natural course. Therefore, there was a significant difference between physiological ageing and oral frailty.

COLUMN Metabolic syndrome and oral frailty

Herein, we provide a further explanation for oral frailty while citing the metabolic syndrome prevention campaign, which has become a national movement.

The Metabolic Syndrome Prevention Campaign is a health-promoting activity that has spread throughout Japan as a national movement. The word "metabolic syndrome" has become so familiar to Japanese people that they greet their friends whose stomachs are starting to bulge slightly by saying, "Are you suffering from metabolic syndrome?" Figure I-10 illustrates the concept of metabolic syndrome. Metabolic syndromes are caused by environmental factors. First, a person becomes obese and suffers from diseases such as hypertension, carbohydrate metabolism disorders, and dyslipidemia. These diseases can cause arteriosclerosis, which may eventually result in diseases that are highly likely to directly reduce the quality of life, such as myocardial and cerebral infarctions. Diagnostic criteria for metabolic syndrome include a waist circumference of 85 cm or more for males and 90 cm or more for females, which have attracted the most attention from Japanese people and provide an image that is easy to understand for pathological conditions. As mentioned previously, the phrase "having a slightly big waist," which indicates the pre-stage of various diseases, has been used to check the development of metabolic syndrome and provided a symbolic image of the syndrome.

Let us consider the concept of oral frailty (Figure I-5) in the context of metabolic syndrome. The "oral hypofunction ("third level: decline in oral function")" handled in the present manual may correspond to hypertension, disorder of carbohydrate metabolism, and dyslipidemia. On the other hand, "eating and swallowing disorder ("fourth level: impairment of eating function")" may correspond to myocardial and cerebral infarction. The stage corresponding to obesity, namely "having a slightly big waist," a criterion for the metabolic syndrome that attracted the most attention from Japanese people, can be regarded as the "second level: minor oral problems."

Oral frailty is a pathological condition that originated from "a decline in awareness of oral health (decline in oral health literacy)" due to various causes, eventually resulting in an "eating disorder." The concept of oral frailty was developed to raise public awareness of its progression. This concept provides notable insight into each stage of progress. Taking appropriate measures at notable points at each progressing stage would prevent the pre-staging of diseases. The diagnosis of "second level: minor oral problems," which is the pre-stage of "oral hypofunction (third level: decline in oral function)," is made through a medical examination. Therefore, recognizing the symptoms included in the "second level: minor oral problems" and taking appropriate measures for these symptoms would be the most essential points of the concept. Coping with "the second level"

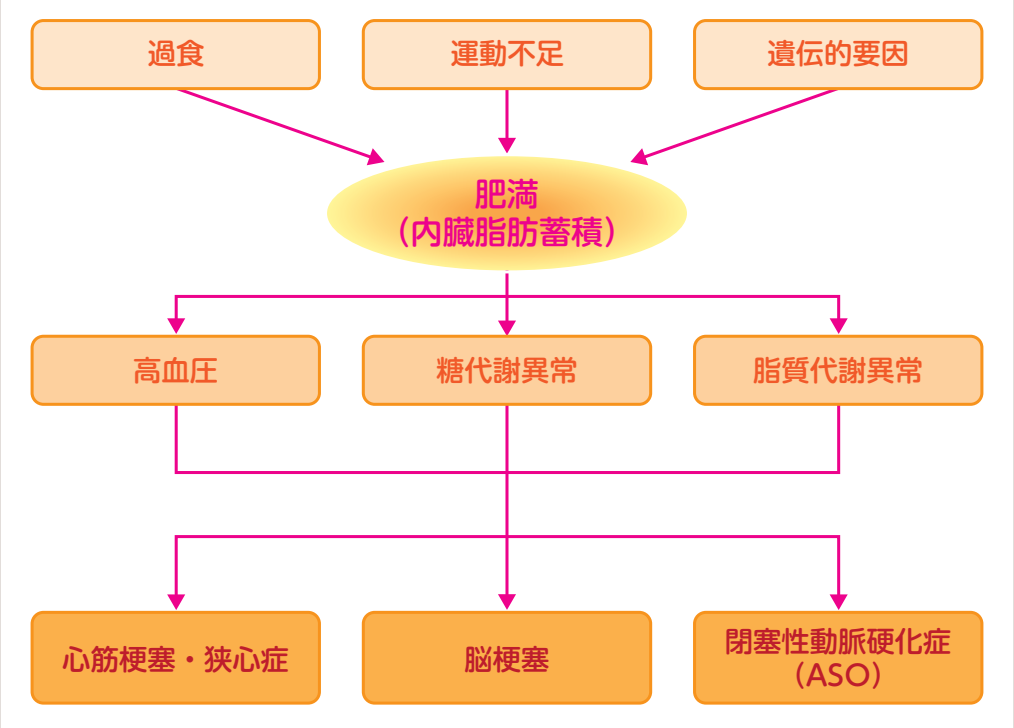

Figure I-10. Concept of metabolic syndrome

appropriately may correspond to checking a waist circumference in metabolic syndrome.

"Oral frailty" can also be used as a catchphrase for raising public awareness. Therefore, our oral frailty measures aim to inform Japanese people of the significance of oral function examinations and encourage them to visit dental clinics, thereby detecting a functional decline in the oral cavity and taking appropriate measures as early as possible.