標準的な健診・保健指導プログラム（改訂版）　英訳

第 2 編　健診　Medical Checkup

Chapter 1
The significance of directing attention to metabolic syndrome

In April 2005, eight medical societies, including the Japanese Society of Internal Medicine, jointly developed the disease concept of and diagnostic criteria for metabolic syndrome.

Metabolic syndrome is a condition characterized by hyperglycemia, hyperlipidemia, and hypertension, which are commonly caused by visceral fat accumulation. When these abnormalities occur simultaneously, the risk of developing ischemic heart disease, cerebrovascular disease, etc. increases. Therefore, therapeutic approaches to metabolic syndrome are based on the concept that reducing visceral fat accumulation can reduce the risk of developing these diseases.

More precisely, diabetes mellitus, hyperlipidemia, and hypertension due to visceral fat accumulation can be prevented through lifestyle improvements; even after the onset of these comorbidities, and progression to or aggravation of ischemic heart diseases such as myocardial infarction, cerebrovascular diseases such as cerebral infarction, and renal failure requiring dialysis therapy can be prevented via blood glucose control and blood pressure control.

With the introduction of the metabolic syndrome concept, it is possible to provide detailed explanations regarding how visceral fat accumulation and weight gain can lead to increased blood glucose and triglyceride levels, hypertension, and arteriosclerosis induced by various mechanisms of vascular impairment, which might cause ischemic heart disease, cerebrovascular disease, and renal failure. Individuals undergoing medical checkups can easily understand the relationships between their lifestyle and medical checkup results or disease onset. Therefore, this approach will enhance individuals' motivation to improve their lifestyle.

Chapter 2
Contents of the medical checkup

2-1 Medical checkup items (laboratory tests and inquiries)

(1) Basic policies

- In order to reduce lifestyle-related diseases such as diabetes mellitus, especially to reduce the incidence of metabolic syndrome or the candidates for metabolic syndrome development, medical checkups should include appropriate laboratory tests to precisely screen people who need health advice. According to the characteristics of the target population (i.e., characteristics of the local community or workplace) and the related health problems, additional laboratory tests, including serum creatinine measurement, other than the basic laboratory tests should be performed as necessary.
- Standard inquiries are to be utilized in following three areas: 1) lifestyle-related disease risk assessment, 2) health guidance stratification, and 3) determination of the message to be provided upon notification of medical checkup results. Therefore, the target population's characteristics should be considered, and other inquiries should be added as necessary.

(2) Medical checkup items

The specific medical checkup includes the basic laboratory tests that all individuals undergo, as well as the detailed laboratory tests that only those individuals designated by the doctor undergo.

1. Basic laboratory tests conducted during the specific medical checkup (See Separate Form 1.)

These include inquiries, anthropometric data (height, body weight, body mass index (BMI), abdominal circumference [visceral fat area]), a physical examination, blood pressure measurements, blood chemistry tests (triglyceride, high-density lipoprotein [HDL] cholesterol, and low-density lipoprotein [LDL] cholesterol levels), liver function tests (aspartate aminotransferase, alanine aminotransferase, and γ-glutamyltransferase levels), and blood glucose tests (fasting blood glucose or hemoglobin [Hb] A1c levels), and urinalysis (sugar and protein in the urine).

*The HbA1c test is a laboratory test that measures blood glucose levels during the previous 1–3 months. HbA1c serves as an index of blood glucose control. Therefore, this measurement can be effectively used to analyze the condition of the evaluated individual for the provision of health guidance. Even if the individual was previously instructed not to eat before the medical checkup, they can eat food and still undergo the medical checkup; blood samples cannot always be collected in fasting. Therefore, both fasting blood glucose and HbA1c tests should be conducted whenever possible. If the health insurer recognizes diabetes mellitus as an urgent issue, the HbA1c test should always be

conducted during the medical checkup. If both results of the fasting blood glucose and HbA1c measurements are available, the fasting blood glucose measurement is preferentially used for stratification judgments with regard to the specific medical checkup/specific health guidance.

*Since 2013, HbA1c has been evaluated according to the level given by the National Glycohemoglobin Standardization Program (NGSP) rather than the conventional level given by the Japan Diabetes Society (JDS). The following formulae can be used to convert NGSP levels to JDS levels and from JDS levels to NGSP levels, respectively.

JDS level (%) = 0.980 × NGSP level (%) – 0.245%

NGSP level (%) = 1.02 × JDS level (%) + 0.25%

2. Detailed laboratory tests conducted during the specific medical checkup (See Separate Form 2.)

Detailed laboratory tests are conducted for the early detection of further aggravation of lifestyle-related diseases. Test items are selected among electrocardiography, funduscopy, or anemia tests (red blood cell count, hemoglobin level, hematocrit level) when the specified standards have been met (see Separate Form 2) and the doctor has recognized the necessity of such tests. At the institution where the medical checkup is performed, the doctor in charge determines the necessity of each detailed laboratory test on a per-case basis and makes decisions accordingly. The standards listed in Separate Form 2 should not be used without evaluation and without reason. The rationale used to make such judgments should be reported to the health insurer and explained to the individual.

3. Other laboratory tests

In medical checkups other than the specific medical checkup, the intentions/objectives of the applicable regulations/system, characteristics of the target population (i.e., characteristics of the local community and workplace), and the health issues of the target population should be considered,and tests other than the basic laboratory tests (1.) should be conducted as necessary. Among these extra tests, serum uric acid and creatinine measurements should be conducted whenever possible.

(3) Inquiries

The standard questionnaire that covers the basic inquiries included in the specific medical checkup is presented as Separate Form 3. These inquiries were developed on the basis of those included in the conventional National Health and Nutrition Examination Survey and those specified by the Industrial Safety and Health Act. The inquiries required for selection/stratification (1–3 [medication use], 4–6 [medical history, present illness], and 8 [smoking history]) are essential to the specific medical checkup. Even when utilizing the results of other medical checkups such as those obtained with the medical checkup specified by the Industrial Safety and Health Act, responses to the essential inquiries

should always be obtained.

The responses to the standard and essential inquiries provide important information with regard to health guidance.

(4) Measurement methods and standardization

- Multiple institutions provide medical checkups. Therefore, the health insurer should collect the medical checkup results of the insured individual from the institutions and manage these data in an integrated manner. The health insurer should then identify those individuals who are highly likely to benefit from prophylactic intervention and preferentially provide these individuals with health guidance. For this purpose, common judgment standards should be developed and the measurements should be standardized for each test item in the medical checkups.
- The institutions responsible for providing medical checkups should maintain the reliability of the health guidance levels and medical treatment recommendations through laboratory test standardization.
- The institutions responsible for providing medical checkups should direct careful attention to the time points of blood collection and sample storage/transportation.
- See Separate Form 4 for instructions regarding test performance and considerations for the medical checkups.
- See Separate Form 5 for practical standard measurement methods and test values regarding each medical checkup item.

(5) Measurement accuracy control

- The institutions responsible for providing medical checkups are required to sufficiently control the test measurement accuracy.
- The organizer of the medical checkup should perform both internal and external quality control checkups according to the requirements for accuracy control specified by the Guides for Medical Checkups Conducted by the Health Promotion Organization (Ministry of Health, Labor, and Welfare (MHLW) Announcement No. 242, 2004).

1. Internal quality control (assurance of measurement consistency within the institution responsible for medical checkups)

The institutions responsible for medical checkups are also responsible for the operations related to the implementation of such checkups, including sample collection/transportation/storage of samples, measurements, and laboratory result handling. To appropriately accomplish these operations, the institutions should establish a management system by assigning supervisors and take actions needed for adherence to the specified operation procedures and safety assurances. Thus, the institutions should

maintain the accuracy of the laboratory results.

2. External quality control (assurance of measurement consistency between the institutions responsible for medical checkups)

The institutions responsible for medical checkups should regularly submit to at least one of the external quality control inspections recommended by the Japan Medical Association, the Japanese Association of Medical Technologists, and the National Federation of Occupational Health Associations. Thus, the accuracy of laboratory results should be confirmed by a third party.

(6) Laboratory test results specified in the medical checkup

- See Separate Form 5 regarding the thresholds of health guidance and medical treatment recommendations provided by the laboratory tests.
- Consistency should be assured between these thresholds and the levels in the guidelines established by medical societies in the fields including metabolic syndrome, diabetes mellitus, hypertension, or hyperlipidemia treatment.
- The MHLW should elicit cooperation from the medical societies and research teams to which the ministry provides Health and Labor Sciences Research Grants and should regularly evaluate the standard levels to ensure that these values are based on the latest findings.

(7) Regular review of laboratory tests included in the medical checkup

To provide effective medical checkups and health guidance, the MHLW should not exert control over conventional laboratory testing. The MHLW should consider the efficacy of preventing the development/aggravation of lifestyle-related diseases, elicit cooperation from research teams to which the ministry provides Health and Labor Sciences Research Grants, and regularly review the usefulness/necessity of laboratory tests according to the latest scientific findings. Currently, urinalysis and liver function test results are not used to identify individuals who require health guidance. Additionally, serum uric acid and serum creatinine measurements have not yet been introduced into the medical checkup. The efficacy, necessity, and cost-effectiveness of these examinations should be validated after due consideration of the characteristics of the population subjected to medical checkup. Therefore, the laboratory tests included in the medical checkup should be reviewed as needed.

2-2 Provision of medical checkup results and other necessary information (feedback)

(1) Basic policies

- Generally, lifestyle-related diseases progress without accompanying subjective symptoms. Laboratory test data provide the individuals subjected to medical checkups with important opportunities to recognize their own health problems and improve their lifestyles. To maximize

this benefit of the medical checkup, the results of the medical checkup including severity assessments based on each laboratory test data, and other necessary information should be provided in an easily understood format (feedback) immediately after the checkups to all concerned individuals, irrespective of the use of the data during the selection/stratification process.

- This information should be provided to encourage the concerned individuals to become more aware of the benefits of lifestyle improvements and maintenance as well as to change their behavior. Additional information should be provided to individuals who require medical attention or those who are receiving continuous treatment. For example, information intended to increase awareness about the importance of receiving medical attention and drug therapy should be provided. Information intended to encourage a better awareness of the need to undergo regular medical checkups should be provided to all individuals who underwent the medical checkups. To enhance the effects of feedback, the interval between the medical checkup and results announcement/ the provision of health guidance should be as short as possible.
- Feedback information directing individuals to receive medical treatment is necessary for those individuals who are advised to receive medical attention according to the results of the specific medical checkups. Along with a notification letter, the necessity of medical attention should be directly communicated to the individual during an interview. Efforts should be made to assure the individual with regard to health care access. Continuous support, including determination of the individual's status (whether the subject has already presented hospital or not, etc.), should also be provided to the individual.

(2) Feedback contents

Feedback should be provided to all individuals who underwent medical checkups. The details, however, will differ among the individuals according to the medical checkup results. Sufficient explanations about each test result and comprehensive judgments that reflect the annual variations should be provided to the individuals who underwent medical checkups. For individuals who face serious health problems, the professionals responsible for health guidance should explain their health conditions during an interview conducted immediately after the medical checkup. Thus, results that are more effective can be expected in such cases.

By using the example expressions included in the appendix, the professional responsible for health guidance should consider the individual degree of risk and provide appropriate advice as possible.

1. Individuals who require urgent medical attention

Some persons are determined to be at the stage in which immediate medical treatment is required. The professionals responsible for health guidance should unfailingly help the individual receive immediate

medical attention. Especially if such individuals should be placed immediately under medical management, they should be strongly advised to receive immediate medical attention prior to specific health guidance even if they need the guidance. Such individuals might be thought to require specific health guidance as long as they are not prescribed drug therapies. But priority should be given to urgent issues and appropriate judgments should be made.

Individuals who do not have primary care physicians could take this opportunity to find such physicians.

Some individuals might discontinue treatment or hesitate to receive medical attention. In such cases, the individual's consideration and acceptance of their present conditions should be understood, and the factors contributing to the denial of medical treatment should be identified and considered. Next, efforts should be made to modify the decision. Moreover, the professionals responsible for health guidance should help the individual decide the limit date by when they should receive medical attention or ask the individual to provide the professional with the results of consultations with physicians. Thus, the individual will become increasingly aware of the need to consult with his or her physician and the increased motivation can lead to receiving medical attention.

2. When priority is given to lifestyle improvements

In cases that are less urgent than those described above, abnormal laboratory results are detected and lifestyle improvements are subsequently recommended. Both individuals who do and do not require specific health guidance can be included in this group. When feedback is given to these individuals, the following concrete information should be included in the messages as needed: the types of risks faced by the individuals, the degree of these risks, the ways in which the individuals' lifestyles adversely affect their health conditions, and methods for improving their lifestyles. An examination to support each individual is introduced as follows. Health guidance is provided to them primarily to improve their lifestyle based on physician's advice, following up carefully to facilitate the recognition of their own health conditions, including how many risk factors were detected during the medical checkup and the degree of risk severity. If individuals fail to improve their lifestyle, they should be advised to receive medical treatment.*

Hypertension and smoking are the critical risks associated with the development of ischemic heart disease and cerebrovascular disease. Therefore, appropriate blood pressure control and smoking cessation should be emphasized during the medical checkup and individual interviews. Smokers are advised to participate in smoking cessation support programs or visit smoking cessation clinics.

*Some persons might have blood pressure levels that exceed the level at which medical treatment is recommended but are considered Grade I hypertension (systolic blood pressure, 140–159 mm Hg; diastolic blood pressure, 90–99 mm Hg). Generally, the first strategy in these cases is a 3-month

lifestyle improvement program rather than drug therapy. There are two available lifestyle improvement options. First, the individual might consider their medical checkup results and attempt to make lifestyle improvements on their own. Second, the individual might receive necessary support, including health guidance regarding lifestyle improvement. In cases of hyperlipidemia, a three to six-month lifestyle improvement program should be introduced as the primary prophylactic strategy (for those who do not experience ischemic heart disease). Individuals who have met the criteria of specific health guidance should be examined in light of the guidelines established by the medical societies, and should initially receive health guidance according to the judgment of the physicians at the institutions responsible for the medical checkups. If this strategy is unsuccessful, individuals are advised to seek medical attention as needed.

3. When no definite problem is identified in the medical checkup results

The medical checkup results might show no health problems. The concerned individuals are notified of the fact that their medical checkup results reflected no definite problems. They are also notified about the possible risks, and advised to receive regular medical checkups. If the medical checkup results improve, the individuals' efforts to improve their lifestyle should be appreciated. They are encouraged to keep their improved lifestyle and undergo a medical checkup during the following year. These positive approaches should be taken to increase the individuals' awareness.

Even if the medical checkup revealed no abnormalities, individuals have room to improve their lifestyle including smoking cessation. In such a case, they should be notified about the close relationship between smoking etc. and lifestyle-related diseases, and advised to improve their lifestyle.

(3) Considerations before the provision of information

Blood pressure should be measured repeatedly because some individuals might experience white coat hypertension. Others might have consumed meals immediately before triglyceride measurements, or consumed alcoholic beverages on the day before the measurement. Such behaviors exert considerable effects on the measurement results. Therefore, the laboratory results should be reported after due consideration of these effects.

(4) Follow-up after the provision of advice to receive medical attention

Some individuals will follow the advice to receive medical attention and will therefore be administered drug therapy. These individuals should be carefully followed-up to ensure that they do not cease treatment at their own discretion.

Chapter 3
Selection and stratification of the individuals requiring health guidance

(1) Basic policies

- Visceral fat accumulation increases the risk factors including high blood pressure, increased blood glucose levels, or lipid abnormalities. Individuals with more risk factors are more vulnerable to ischemic heart disease or cerebrovascular disease. To effectively/efficiently provide health guidance, individuals who might receive greater benefits from prophylactic programs should be clearly identified. Therefore, attention should be directed to the degree of visceral fat accumulation and the number of risk factors for appropriate selection of individuals requiring health guidance.
- Numerical standards are needed to stratify individuals who require health guidance. These standards will be used for stratification according to metabolic syndrome that will likely address the prevention of lifestyle-related diseases and evaluation of the outcomes of health promotion programs; these outcomes might include determinations of appropriate reductions in individuals with and candidates for lifestyle-related diseases.
- As lifestyle improvements during earlier life stages are expected to produce stronger prophylactic effects, age-appropriate health guidance levels should be established.
- Individuals who have submitted the results of medical checkups that are equivalent to the specific medical checkup should be screened/stratified and receive specific health guidance in the same manner as those who underwent the specific medical checkup.

(2) Concrete selection/stratification methods

Step 1 Risk assessment of visceral fat accumulation

- The risk of visceral fat accumulation is assessed according to the abdominal circumference and BMI.
  - ✓ Abdominal circumference: Men, ≥ 85 cm; Women, ≥ 90 cm ➔ (1)
  - ✓ Abdominal circumference: Individuals who are not included in the above category (1) and whose BMI exceeds 25 kg/m^2 (BMI ≥ 25 kg/m^2) ➔ (2)

Step 2 Assessment of the number of additional risks

- The additional risks are enumerated on the basis of the laboratory results and descriptions on the questionnaire.
- The risk of metabolic syndrome can be evaluated by determining whether the conditions listed in each of the three sections (1.–3.) have been met. Other related risks are included in the fourth section (4.). The smoking history (4.) is counted only if at least one of the conditions in each of

the previous sections (1.–3.) has been met.

1. Increased blood glucose
    a. Fasting blood glucose level ≥100 mg/dL,
    b. HbA1c level ≥ 5.6% (NGSP), or
    c. Currently receiving drug therapy (according to the questionnaire)
2. Lipid abnormalities
    a. Triglyceride level ≥ 150 mg/dL or
    b. HDL cholesterol level < 40 mg/dL or
    c. Currently receiving drug therapy (according to the questionnaire)
3. Increased blood pressure
    a. Systolic blood pressure ≥ 130 mm Hg or
    b. Diastolic blood pressure ≥ 85 mm Hg or
    c. Currently receiving drug therapy (according to the questionnaire)
4. Questionnaire
    Existing smoking history

Step 3 Classification of the health guidance levels

On the basis of the assessment results obtained in Steps 1 and 2, the health guidance levels are grouped as listed below. As mentioned previously, the smoking history (4.) is counted only if one or more conditions from each previous section (1.–3.) have been met.

Case (1)

The number of additional risk factors listed in the 4 sections (1.–4.)

≥2 (Individuals with ≥2 risk factors are classified as requiring intensive support)

1 (Individuals with 1 risk factor are classified as requiring motivational support)

0 (Individuals with 0 risk factors are classified as requiring the provision of information)

Case (2)

The number of additional risk factors listed in the 4 sections (1.–4.)

≥3 (Individuals with ≥3 risk factors are classified as requiring intensive support)

1–2 (Individuals with 1–2 risk factors are classified as requiring motivational support)

0 (Individuals with 0 risk factors are classified as requiring the provision of information)

Step 4 Exceptional applications of specific health guidance

- Individuals aged 65–75 years should improve their lifestyles preventing quality of life

deterioration. Therefore, lifestyle improvement programs for these individuals should be based on their activities of daily living and motor function. Even if the individuals are classified in the intensive support group, they should be treated as people classified in the motivational support group.

- Individuals who are receiving antihypertensive therapy and visit a medical institution regularly should receive lifestyle improvement support as a part of their continuous medical management at the medical institution. These individuals are not required to receive specific health guidance from the health insurer. However, in collaboration with the treating physicians, the health insurer can provide health guidance to these individuals to ensure steady lifestyle improvements and effectively prevent treatment discontinuation. If the medical checkup shows an abnormal laboratory result that exceeds the threshold of health guidance and even if the test is unrelated to the disease controlled at the medical institution, the data should be provided to the physicians treating the individuals.

(3) Considerations

- When necessary, health insurers should examine at their discretion the possibility of providing health guidance to individuals who are not included among those requiring motivational or intensive support. For individuals who are not considered to have visceral fat accumulation according to their abdominal circumference measurements, the risks of lifestyle-related diseases should be assessed with laboratory tests used for evaluation of the risk factors such as increased blood glucose levels/high blood pressure/lipid abnormalities.
- Some individuals who require health guidance might be aged ≥65 years. In such cases, sufficient attention should be directed to preventing locomotive syndrome[1], decreased oral function, undernutrition, and cognitive impairment[2]. These individuals should be provided with health guidance suitable for their conditions.
- If many individuals who require the specific health guidance are classified in the intensive support group, the medical checkup results and responses to the questionnaire should be considered, and individuals who are likely to receive greater benefits from prophylactic programs, including lifestyle improvements, should be identified clearly. The priority order should then be specified and health guidance should be provided efficiently (see Volume 3).
- In the future, the selection/stratification standards for individuals requiring health guidance should be reviewed as needed on the basis of the results of the specific medical checkups/ health guidance and new scientific findings.

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[1]Locomotive syndrome is defined as a condition in which the locomotoriums are impaired and the

degree of independence decreases. Individuals with locomotive syndrome are more likely to require nursing care. To prevent locomotive syndrome, walking ability maintenance and improvements are important.
[Source] Guidebook on locomotive syndrome 2010 (The Japanese Orthopaedic Association) (in Japanese)

[2]The efficacies of nutrition improvement (e.g., serum albumin level maintenance), oral function maintenance/improvement, and cognitive impairment prevention (active introduction of brain-activating exercise/physical activity into the programs for individuals with mild cognitive impairment) have been confirmed.
[Source] Nursing Care Prevention Manual (Revised in March 2012; Health and Welfare Bureau for the Elderly, MHLW) (in Japanese)
http://www.mhlw.go.jp/topics/2009/05/tp0501-1.html

Chapter 4
Roles of the organizations involved in the medical checkup

(1) Roles expected to be fulfilled by the health insurer

- The health insurer is required to organize specific medical checkups for insured individuals and their dependents aged 40–74 years. The health insurer sends notification letters and places telephone calls to the insured individual and their dependents to encourage medical checkup compliance. In cases of outsourced medical checkups, the health insurer should select the appropriate institutions.
- The health insurer is expected to inform the individuals who underwent the medical checkups about the health problems suggested by the results in an easy-to-understand manner.
- When the laboratory results exceed the medical treatment recommendation level, the health insurer should consider the severity and the individual's age and recommend that he/she seek medical attention. The health insurer should advise individuals who require consultation with hospital physicians to seek medical attention without fail.
- For individuals who are receiving drug therapy, the health insurer should assess the medical checkup and health insurance claim data and examines the possibility of providing the necessary health guidance to them.
- For individuals who were recommended to receive treatment at a hospital, the health insurer should follow up these individuals by assessing their health insurance claims to confirm whether they actually sought treatment at a hospital. Some individuals might not receive appropriate medical attention. For these individuals, the health insurer should explain the necessity of continuous treatment for the prevention of ischemic heart disease and cerebrovascular disease in an easy-to-understand manner and encourage the individuals to restart treatment.

(2) Roles of the institution responsible for the medical checkup

- The institution that has been commissioned by the health insurer should conduct the specific medical checkup appropriately.
- The institution should inform the individuals who have undergone medical checkups about the health problems suggested from the results in an easy-to-understand manner.
- When the laboratory results exceed the medical treatment recommendation level, the institution should consider the severity and the individual's age and recommend that they seek medical attention. The institution should strongly advise individuals who require consultations with hospital physicians to seek medical attention.

(3) Roles of the health promotion department of the municipal government

- The health promotion department of the municipal government might organize a health guidance or health counseling program for residents by using the medical checkup or health insurance claims data collected by the health insurer and the nursing care insurance data collected by the nursing care department of the municipal government. These health care data are confidential and require particularly strict control. Therefore, in collaboration with the health insurer and the nursing care department of the municipal government, the health promotion department should handle these data according to the instructions.)
- The health promotion department should consider the above instruction and then, in collaboration with the treating physician and health insurer, should assess the medical checkup and health insurance claims data and provide health guidance to individuals who are receiving drug therapy.
- In collaboration with the health insurer, the health promotion department should assess the health insurance claims and medical treatment records to ensure that the department takes the appropriate actions for individuals who were advised to receive medical attention but have not consulted with a hospital physician, and provide the health guidance to individuals other than that requiring specific health guidance.
- Individuals who were advised to receive medical attention but who have not consulted with a hospital physician might attend the health guidance program organized by the health promotion department. These individuals should receive explanations of the necessity for appropriate medical interventions to prevent ischemic heart disease and cerebrovascular disease.

(4) Roles of the medical institution

- The medical institution should assess the medical checkup results of individuals who are referred for treatment, and should continuously provide them with the necessary treatment and support for lifestyle improvements, including nutrition/exercise guidance. If the conditions specified by the medical treatment fee system have been met, fees can be charged for the management of lifestyle-related diseases, outpatient nutritional/dietary guidance from a managerial dietitian, and group nutritional/dietary guidance.
- Individuals with diabetes mellitus, hypertension, or hyperlipidemia either might not receive treatment or might discontinue treatment. When such cases are identified, the necessity of continuous medical intervention to prevent ischemic heart disease and cerebrovascular disease should be explained to these individuals in an easy-to-understand manner. Thus, the individuals should be encouraged to receive/resume treatment.

Chapter 5
Digitization of medical checkup data

5-1 Standard electronic system for medical checkup data submission

(1) Basic policies

- According to the Act on Assurance of Medical Care for Elderly People, the medical checkup data obtained by the various sectors during the specific medical checkup/specific health guidance process may be sent to the health insurer in the following manner.

Medical checkup data

1. The institution responsible for the medical checkup/institution responsible for health guidance ➔ Health insurer
2. Health insurer (responsible for dependent's medical checkup) ➔ Health insurer (by which the dependent is covered)
3. Health insurer (before transfer) ➔ Health insurer (after transfer)
4. Institution responsible for the medical checkup as specified by the Industrial Safety and Health Act ➔ Health insurer (by which the individual is covered)
5. Insured individual/dependent who underwent other medical checkups ➔ Health insurer

Conditions for implementing the specific medical checkup/specific health guidance

6. Health insurer ➔ MHLW, Health Insurance Claims Review & Reimbursement Services

- As noted above, a wide variety of data is communicated between sectors during the specific medical checkup/specific health guidance process. An enormous quantity of information is thus communicated through complicated pathways. The MHLW established a standard electronic system to assure data compatibility and the continuous handling of many types of data.

(2) Considerations

- Personal information should be protected carefully during the medical checkup data communication process.
- In the future, data obtained from other medical checkups, including health screenings, should be collected according to procedures based on this standard electronic system.
- The collected electronic information should be backed up in multiple locations for security purposes.
- The health insurer should electronically provide the medical checkup results at the request of the insured individual.

5-2 Determination of standard laboratory test codes

(1) Basic policy

- Enormous quantities of digital medical checkup data are handled continuously during specific medical checkups. If the laboratory test and inquiry descriptions are not integrated or standard descriptions are not used, the electronic system cannot correctly identify the laboratory tests. Therefore, standard codes should be assigned to the laboratory tests and inquiries in order to standardize their descriptions.

(2) Concrete standard codes

- Japan Laboratory Analysis Code version 10 (JLAC10), developed by the Japanese Society of Laboratory Medicine, or the 17-digit codes, developed in accordance with the JLAC10 coding system, are used to describe all medical checkup data.
- New laboratory tests might be added in the future. In such cases, these tests will be assigned codes in accordance with the JLAC10 system upon consultation with the Japanese Society of Laboratory Medicine.

*The standard code table is available at the following website:
http://www.mhlw.go.jp:10080/bunya/shakaihosho/iryouseido01/info02i.html

(Reference)

Examples of standard codes for basic laboratory tests (JLAC10 codes [17-digit])

Laboratory test	Test method	JLAC10 Code
Triglyceride	Visible absorption photometry (Enzyme colorimetric assay/glycerol elimination)	3F015000002327101
	Ultraviolet spectrophotometric method (Enzyme colorimetric assay/glycerol elimination)	3F015000002327201
	Others	3F015000002399901

5-3 Coding of the institutions responsible for the medical checkup/health guidance

(1) Basic policies

- The medical checkup data that are managed by the health insurer carry specific codes for each institution responsible for the medical checkups.
- Assessments of the programs and sufficient analyses of the medical checkup data are needed to successfully reduce incidence of lifestyle-related diseases, including diabetes mellitus, and the numbers of candidates for disease development. Therefore, all institutions responsible for medical checkups/health guidance should be coded so that the data collected at an institution can be

compared with data collected from other institutions.

- All medical service providers affiliated with the National Health Insurance (NHI) have already been coded, and the same coding system has been adopted for the medical institutions responsible for medical checkups/health guidance. The institutions responsible for medical checkups are coded according to the following rule; they should not determine their codes by themselves.

(Reference)
Rule for coding the institutions responsible for medical checkups/health guidance
*For details, see the Handbook for Effective Implementation of the Specific Medical Checkups/Specific Health Guidance (Health Insurance Bureau, MHLW).

- The institutions responsible for medical checkups include many NHI-affiliated medical service providers that have already been coded. Therefore, this coding system should reasonably be utilized to express the codes in the following manner (10-figure code): 'Prefectural No. (2 figures) + Institution category code (1 figure) + Institution code (6 figures) + Check digit (1 figure).'

  *To eliminate the possibility of repeated issuance of the same code, a single organization should be responsible for code issuance and unused or blank code management.
- According to the above rule, an NHI-affiliated medical service provider should use its current NHI medical service provider code as its institution code and check digit; in such cases, the institution category code is '1', indicating a medical institution.
- An institution without a code for an NHI-affiliated medical service provider can obtain a code by applying to the organization in charge of code issuance and management for issuance of the following: 'Institution category code (1 figure) + Institution code (6 figures)'.
- When an institution without a code for an NHI-affiliated medical service provider that serves as a new provider of medical checkups/health guidance alone apply for new code issuance, '2' should be used as its institution category code.

- The 10-figure code issued by the Health Insurance Claims Review & Reimbursement Services should be used to collect information regarding the codes of the institutions responsible for medical checkups and appropriately organize the registers.

5-4 Medical checkup results storage and utilization

(1) Basic policies

- The health insurer can provide effective/efficient medical checkups/health guidance by using the

medical checkup data accumulated to date. Because the insured individual and their dependents must manage their health conditions throughout their lifespans, their regular medical checkup results should be stored continuously.

- For this purpose, the medical checkup data should be stored for as long as possible to provide access to the health insurer and the insured individual/their dependents.
- The health insurer should examine the possibility of establishing a system that would enable the accumulation of individual medical checkup data and the management of lifelong medical checkup data.
- The insured individual/their dependents might be transferred from one health insurer to another. In such cases, the medical checkup data of an individual should also be transferred to the new insurer after acquiring consent from the insured individual/their dependents.
- During the medical checkup data communication process, sufficient care should be taken to protect personal information.

(2) Storage period

- The health insurer should store the specific medical checkup results for the duration of one of the following periods (whichever ends first):

  1. Five years from the year after the year in which the record was prepared
  2. The end of the year following the year in which the insured individual/their dependents selected a different health insurer

- In light of the abovementioned basic policy in section (1), the health insurer should store their medical checkup data for the entire duration in which the insured individual/their dependents are aged 40–74 years.

(3) Considerations

- An individual might be transferred from one health insurer to another. In such cases, their medical checkup data should be transferred in the following manner: the new health insurer issues a new insurance number/code for the transferred individual. Next, the medical checkup data management number/code used by the former health insurer is replaced by the new number/code. Thus, the new health insurer can use the new number/code to manage the transferred individual's medical checkup data.
- The former health insurer should store the medical checkup data of the individual who was not covered until their data are managed by the new insurer or for a given period of time (e.g. approximately one year) to ensure continuous data management as possible.
- At the request of the insured individual, all of their data collected at and after 40 years of age should be transferred to the new health insurer.

- The insured individual should continuously confirm their own medical checkup data and utilize these data to self-manage their health conditions. For this purpose, the possibility of establishing an annual data accumulation system should be examined and the accumulated annual data should be effectively utilized for health guidance. These approaches promote analyses of the health conditions within populations and annual data variations and facilitate the development of prophylactic strategies.

(Reference)

How to utilize the individual number during the medical checkup data management process while maintaining uniqueness

- The existing insurer number (8-figure number comprising the law-specified and prefectural numbers) and a unique individual number (e.g. the code/number currently used by the insured individual/dependent, employee number, medical checkup reference number) are used.
- Once an individual number is issued, the same number should not be used again. For example, insurance number uniqueness can be maintained by adding the last two figures of the year of issuance to the insurance number.
- An insurance card code/number might not be assigned to each person. In such cases, an individual can be identified by using the insurance card code/number in combination with other information, including the date of birth and name written in Katakana or an added suffix number.

(Case example)

In principle, Amagasaki City in the Hyogo Prefecture stores all the medical checkup records for its staff while they are employed in the city. A retrospective analysis of these data, which were stored for long periods, revealed that individuals who experienced myocardial infarction aggravation had suffered obesity accompanied by increased triglyceride levels for more than 10 years' duration. If these individuals had received medical intervention at an earlier stage, the myocardial infarction aggravation could have been prevented. Therefore, these data can contribute to the development of effective prophylactic strategies, including the preferential provision of medical interventions for individuals with similar conditions.

Chapter 6
Outsourcing of the medical checkups

(1) Basic policies

1. The significance of promoting outsourcing

Medical checkup programs should be structured to serve the users' convenience (e.g. availability on Saturdays, Sundays, and national holidays). By promoting outsourcing of the medical checkups, the users' needs could be satisfied and the percentage of individuals who could undergo medical checkups would increase. However, outsourcing might lead to price wars that could compromise the quality of the medical checkups. Therefore, the outsourcing contractor should be an institution that can assure high-quality medical checkups.

2. Concrete outsourcing procedure

Medical checkups can be outsourced according to the following procedure. First, outsourcing standards should be developed. Second, an outsourcing contractor that can appropriately conduct the medical checkups, including the program-specific laboratory tests, should be selected. The health insurer should independently establish and evaluate the specific medical checkup/health guidance programs.

3. Requirements for the health promotion organizations serving as outsourcers

During the outsourcing period, the health promotion organization is required to monitor whether the medical checkup has been conducted appropriately.

The organization should recognize the nature and importance of personal information and handle the information appropriately. According to the Basic Policy on the Protection of Personal Information (a Cabinet decision dated April 2, 2004,) the healthcare field has been designated as a field that requires the assurance of particularly appropriate and strict personal information handling, given its nature and specific usage. Therefore, outsourcing contractors should handle personal information appropriately.

The health promotion organization can outsource only the data handling operation, including handling of the medical checkup results. In such cases, the outsourcing contractor is required to follow the standards for proper medical checkup data handling as specified by the MHLW Notification No. 92, 2013 (Standards for Outsourcing), and MHLW Notification No. 93, 2013 (Standards for Facilities).

4. Requirements of the outsourcing contractor

The outsourcing contractors should appropriately control the medical checkup accuracy to avoid differences in measurements and judgments between the institutions responsible for the medical checkups.

The standards adopted for the medical checkups conducted at the outsourcing contractor institution should also be applied to medical checkups using a mobile van.

The institution should actively foster health promotion programs, including total ban on smoking in the institutional site.

The health promotion organization can directly perform medical checkups. In such cases, the relevant standards should be strictly followed.

(2) Concrete standards

Specific medical checkups can be outsourced in pursuance of the standards specified by the MHLW Announcements No. 92, 2013 (Standards for Outsourcing), and No. 93, 2013 (Standards for Facilities). In cases in which medical checkups other than the specific medical checkups are outsourced, these announcements should be followed.

Chapter 7
Conducting a medical checkup/health guidance for people aged 75 years and over, and people under 40 years of age

7-1 Conducting a medical checkup/health guidance for people aged 75 years and over

(1) Basic policies

- For people who are aged 75 years and over and do not receive treatment in an outpatient clinic regularly, it is important to utilize opportunities including medical checkups to detect lifestyle-related diseases such as diabetes at an early stage. This will enable them to receive medical treatment early, and prevent the aggravation of these diseases.
- Improvements in one's lifestyle help prevent lifestyle-related diseases. This prophylactic effect, however, seems to be smaller for people aged 75 years and over than for people aged less than 75 years. In addition, as compared to people aged below 75 years, those aged 75 years and over are less likely to succeed in improving their lifestyles. Finally, as people aged 75 years and over are at a higher risk of weight loss and malnutrition, the prevention of decline in their daily living functions seems important to ensure an optimal quality of life (QOL) and to enable them to live independently.
- The physical conditions of people aged 75 years and over differ considerably among individuals. Besides lifestyle-related diseases, there are a number of pathological conditions more frequently detected among this population that should be prevented, including locomotive syndrome, decreased oral function, malnutrition, and cognitive impairment. Therefore, the health conditions for each individual in this age group should be monitored, and appropriate support should be provided to help them improve their lifestyle.

(2) Medical checkup

- Basically, the test items in medical checkups for lifestyle-related diseases such as diabetes applied to the people who are 75 years old and over should be the same as the ones applied to the people who are under 75 years of age.
- The test items included in general medical checkups should be the same as the essential test items included in specific medical checkups focusing on lifestyle-related diseases. At the discretion of the physician in charge, measurement of the abdominal circumference should be conducted.
- For test items performed as detailed examinations such as electrocardiogram (ECG) at the physician's discretion, the physician undertaking the medical checkup should evaluate each patient's need for such examinations and determine whether the patient needs additional test(s) or not. If people are recommended for additional test(s), they should undergo the necessary examinations at a medical institution.

- The people who regularly visit their primary physicians for lifestyle-related diseases, including diabetes, might not necessarily undergo the medical checkup.

(3) Health guidance

- Sufficient attention should be directed to the maintenance of residual ability and the assurance of QOL in people aged 75 years and over. Generally, physical condition, activities of daily living, and mobility differ substantially among individuals. Therefore, the same health guidance for behavior modification provided for people aged 40 to 74 years should not be applied to all people aged 75 years and over. For these people, appropriate health consultations or guidance should be provided based on the result of the medical checkup. Similarly, a system should be established that enables them to receive necessary health consultations or guidance.

(4) Collaboration with the department in charge of nursing care programs

- In some municipal governments, the Department of Welfare for the Elderly might be responsible for nursing care programs and organize various activities to ensure the well-being of the elderly and to maintain/improve their daily living functions. In such case, the department responsible for health guidance should organize medical checkups/health guidance programs for the elderly in collaboration with the department governing nursing care programs by sharing people's data.

7-2 Conducting a medical checkup/health guidance for people under the age of 40 years

- As compared to people aged below 30 years, those who are in their 40's are more likely to suffer from metabolic syndrome or to be candidates for metabolic syndrome development. Therefore, people under the age of 40 years should be provided with educational programs that help them understand the importance of a healthy lifestyle and the methods of preventing lifestyle-related diseases. Besides these educational programs, health insurers must encourage the insured to undergo general medical checkups before they reach the age for specific medical checkups/specific health guidance (the insured are generally advised to undergo medical checkups when they reach the ages of 30 and 35). Subsequently, specific health guidance is provided only for people who must improve their lifestyle. In this manner, the number of people requiring specific health guidance can be reduced substantially.
- It has been clearly demonstrated that weight gain after 20 years of age is associated with onset of lifestyle-related diseases.[*] Therefore, insured people should be provided with health guidance and educational programs that help them maintain appropriate body weight as early on as possible.

*According to a study on Japanese people comparing those who gained less than 5 kg weight for about 30 years after the age of 20 with those who gained more than 5 kg weight during this period, men who

gained more than 5 kg weight had a 2.61-fold greater risk of developing diabetes and women had a 2.56-fold greater risk of developing diabetes. (Nanri A, Mizoue T, Takahashi Y,et al. J Epidemiol Community Health doi: 10.1136/jech. 2009. 097964, 2011)

Separate Form 1

Comparison between specific medical checkups and medical checkups as specified by the Industrial Safety and Health Act and the School Health and Safety Act

			Specific medical checkup	Medical checkup specified by the Industrial Safety and Health Act	Medical checkup specified by the School Health and Safety Act *4
Examination	Questionnaire (history taking)		○	○ *1	○
	Measurement	Height	○	●1	○
		Weight	○	○	○
		BMI	○	○	○
		Abdominal circumference	○	●2 *2	○
	Physical findings (physical examination)		○		
	Blood pressure		○	○	○
	Visual acuity			○	○
	Hearing acuity			○	○
	Examination for subjective/objective symptoms			○	○
Lipids	Triglyceride		○	●2	○
	HDL-cholesterol		○	●2	○
	LDL-cholesterol		○	●2	○
Liver function	AST (GOT)		○	●2	○
	ALT (GPT)		○	●2	○
	γ-GT (γ-GTP)		○	●2	○
Metabolic system	Fasting blood glucose		◎	◎	◎
	HbA1c		◎	◎	◎
	Sugar in the urine (semi-quantitative test)		○	○	○
Blood in general	Hematocrit value		△		
	Hemoglobin level		△	●2	○
	Red blood cell count		△	●2	○
Urine/kidney function	Protein in the urine (semi-quantitative test)		○	○	○
	Occult blood in the urine				
	Serum creatinine				
12-lead ECG			△	●2	○
Funduscopy			△		

Chest X-ray examination		●3	○
Upper gastrointestinal X-ray examination			
Sputum examination		△ *3	△

Abbreviations: BMI = Body Mass Index, HDL = high-density lipoprotein, LDL = low-density lipoprotein, AST (GOT) = aspartate aminotransferase (Glutamic Oxaloacetic Transaminase), ALT (GPT) = alanine aminotransferase (Glutamic Pyruvic Transaminase), γ-GT (γ-GTP) = γ-glutamyltransferase (γ-glutamyl transpeptidase), HbA1c = hemoglobin A1c

○: Essential item.

△: Optional item (performed at the physician's discretion).

◎: Item that can be replaced by other items.

●1: Item that can be eliminated at the physician's discretion if the subject is 20 years old and over.

●2: Item that can be eliminated at the physician's discretion if the subject is under the age of 40 years (except for people aged 35).

●3: Item that can be eliminated at the physician's discretion if the subject is under the age of 40 years (except for people aged 20, 25, 30 and 35 years), is not a worker requiring regular medical checkups for tuberculosis, as specified by the Infectious Disease Law, and is not a worker requiring the triennial medical checkup for pneumoconiosis, as specified by the Pneumoconiosis Act.

*1: Strict checking of smoking and medication history is recommended (notification No. 697, Labour Standards Bureau, MHLW, dated January 17, 2008).

*2: The item can be eliminated if the physician deems it unnecessary and if the subject meets one of the following conditions:

1. Age < 40 years (people aged 35 years are excluded).
2. Pregnant women or others whose abdominal circumference does not reflect the accumulation of visceral fat.
3. BMI < 20, BMI (kg/m^2) = Body weight (kg)/[Height (m)]^2
4. The subject measures his/her abdominal circumference and reports the result (his/her BMI should be under 22).

*3: The item can be eliminated at the physician's discretion if the subject has no lesion, or is not at risk of developing tuberculosis, as demonstrated by the findings of the chest X-ray.

*4: The item is only applicable to teaching staff.

Separate Form 2

"Detailed medical checkup" items

Of the people who meet the criteria outlined below, those whose physicians recognize the necessity of a detailed medical checkup should undergo the check up [it is not appropriate to recommend people meeting the standards to undergo all items of the detailed medical checkup. The treating physician should consider the individual subject's background (e.g., gender, age, etc.) and make an appropriate judgment for each item]. Subsequently, the physician in charge of the medical checkup should explain to the insurer and the concerned subject the reason for recommending him/her to undergo a detailed medical checkup.

Some people may not need to undergo reexaminations, as the results of laboratory tests conducted at other medical institutions in the recent past may be available. Other people suffering from diabetes, hypertension, hyperlipidemia, ischemic heart disease, or cerebrovascular disease may regularly consult with their physicians at the hospital. These people may not need to undergo a detailed medical checkup. The physicians treating them should consider their current symptoms and make appropriate decisions. Some people may need to consult a physician immediately. They should be strongly advised to go to a hospital for additional examinations, for which medical fees are charged.

(1) 12-lead ECG

- Persons who met the criteria (shown below) related to all the following four conditions at a medical checkup conducted in the previous year: (1) increased blood glucose, (2) lipid abnormality, (3) increased blood pressure, and (4) obesity.

(2) Funduscopy

- Persons who met the criteria (shown below) related to following all four conditions at a medical checkup conducted in the previous year: (1) increased blood glucose, (2) lipid abnormality, (3) increased blood pressure, and (4) obesity.

(3) Anemia test

- Persons with a history of anemia, or those who are suspected of suffering from anemia based on test results.

[Criteria]

1) Increased blood glucose
   a. Fasting blood glucose ≥ 100 mg/dL or
   b. HbA1c (NGSP) ≥ 5.6%

2) Lipid abnormality
    a. Triglycerides ≥ 150 mg/dL or
    b. HDL cholesterol < 40 mg/dL

3) Increased blood pressure
    a. Systolic blood pressure ≥ 130 mmHg or
    b. Diastolic blood pressure ≥ 85 mmHg

4) Obesity
    a. Abdominal circumference ≥ 85 cm (males), ≥ 90 cm (females) or
    b. BMI ≥ 25 kg/m^2

Separate Form 3

Standard Questionnaire

	Questionnaire	Response
1–3	Do you currently use the following drugs[*1]?	1. Yes 2. No
1	a. Antihypertensive drugs	1. Yes 2. No
2	b. Insulin injection or antihyperglycemic drugs	1. Yes 2. No
3	c. Cholesterol-reducing[*2] drugs	1. Yes 2. No
4	Have you been told by a physician that you have suffered a stroke (cerebral hemorrhage, cerebral infarction, etc.) or have you ever received treatment for stroke?	1. Yes 2. No
5	Have you been told by a physician that you suffer from heart diseases (angina pectoris, myocardial infarction, etc.) or have you ever received treatment for heart diseases?	1. Yes 2. No
6	Have you been told by a physician that you suffer from chronic renal failure or have you ever received treatment for chronic renal failure (dialysis)?	1. Yes 2. No
7	Have you been told by a physician that you suffer from anemia?	1. Yes 2. No
8	Are you currently a habitual smoker? (* "A current habitual smoker" is defined as a person who has smoked a total of 100 cigarettes or more, or has a history of smoking for more than 6 months, and has been smoking for the past one month.)	1. Yes 2. No
9	Has your body weight increased by 10 kg or more since the age of 20 years?	1. Yes 2. No
10	Have you performed exercise with slight sweating for 30 minutes or more, at least twice a week, for more than one year?	1. Yes 2. No
11	Do you walk, or engage in some physical exercise equivalent to walking, for one hour or more a day?	1. Yes 2. No
12	Do you walk faster than people who are of nearly the same age and the same sex as you?	1. Yes 2. No
13	Did you experience a weight gain/loss of 3 kg or more in the past year?	1. Yes 2. No
14	Do you eat faster than others?	1. Fast 2. Normal 3. Slow
15	Do you eat dinner within 2 hours before sleep at least three times a week?	1. Yes 2. No
16	Do you eat any snacks after dinner (a bedtime snack, other than three regular meals) three times or more a week?	1. Yes 2. No
17	Do you miss breakfast three times or more a week?	1. Yes 2. No
18	How often do you drink alcoholic beverages (sake, distilled spirit, beer, whiskey, wine, etc.)?	1. Every day 2. Occasionally 3. Rarely (I do not drink)
19	How much do you drink a day? Alcohol content equivalent to a small bottle of sake (180 ml): an average sized bottle of beer (about 500 ml), a glass of distilled spirit (35 proof liquor, 80 ml), a glass of whiskey (60 ml), two glasses of wine (240 ml)	1. < 1 small bottle of sake 2. 1–2 small bottles of sake 3. ≥ 3 small bottles of sake

20	Do you sleep well and get a sufficient amount of rest?	1. Yes 2. No
21	Do you intend to improve your lifestyle, including fitness and dietary habits?	1. I do not intend to improve them. 2. I intend to improve them (within about 6 months). 3. I intend to improve them soon (within about one month). I have already started doing so. 4. I have already attempted to improve them (for less than 6 months). 5. I have already attempted to improve them (for more than 6 months).
22	Do you utilize health guidance services to improve your lifestyle, if available?	1. Yes 2. No

[*1]: Applicable to people undergoing drug treatment according to the attending physician's diagnosis and order.

[*2]: Also applicable to the drugs that decrease serum triglycerides.

Separate Form 3 (Reference)

	Questionnaire	Examples of explanation and utilization of responses
1 2 3	Do you currently use the following drugs? a. Antihypertensive drugs b. Insulin injection or antihyperglycemic drugs c. Cholesterol-reducing drugs	● Some people may have already received treatment for hypertension, diabetes, or hyperlipidemia at hospitals and been placed on drug therapy. They may also have received support at the hospital to help them improve their lifestyles. Therefore, they do not require specific health guidance. This item checks if they need the specific health guidance. ● Note that some people may select "No" as their response because they may just forget to take drug(s); they actually are receiving treatment at a hospital, or may discontinue treatment. This item should be checked sufficiently. ● The expression "cholesterol-reducing drugs" is used to explain the "drugs for hyperlipidemia" in colloquial terms. One needs to remember that drugs that reduce triglyceride levels are also included in this category. ● According to a report, people are less conscious of the drugs for hyperlipidemia than they are of those for diabetes or hypertension. Sufficient consideration should be given to this point. ● After initiation of specific health guidance, the fact that the concerned subject has been placed on drug therapy may be disclosed. Then, they must be excluded from the category of those who requiring specific health guidance. If the subject needs further support for lifestyle improvement, health guidance can be provided in collaboration with their treating physician.
4	Have you been told by a physician that you have suffered a stroke (cerebral hemorrhage, cerebral infarction, etc.) or have you ever received treatment for stroke?	● A subject with a history of stroke is at a higher risk of recurrence of stroke or onset of ischemic heart disease[*1]. ● For people with a history of stroke, support should be provided to improve their dietary habits or physical activity, in collaboration with their treating physician.
5	Have you been told by a physician that you suffer from heart diseases (angina pectoris, myocardial infarction, etc.) or have you ever received treatment for heart diseases?	● A subject with a history of ischemic heart disease such as myocardial infarction is at a higher risk of the recurrence of ischemic heart disease or heart failure[*1]. ● For people with a history of heart diseases, support should be provided to improve their dietary habits or physical activity, in collaboration with their treating physician.
6	Have you been told by a physician that you suffer from chronic renal failure or have you	● A subject with a history of chronic renal failure is at a higher risk of incidence of myocardial infarction, heart

	ever received treatment for chronic renal failure (dialysis)?	failure, or stroke[*2]. ● For the subject with a history of chronic renal failure, support should be provided to improve their dietary habits or physical activity, in collaboration with their treating physician.
7	Have you been told by a physician that you suffer from anemia?	● The type of anemia, cerebral anemia (including orthostatic dizziness due to vagal reaction) or iron-deficiency anemia, the subject was treated for must be confirmed for people who agree with this statement (i.e., select "Yes"). Therefore, the expression "by a physician" was included in this item. ● The present treatment conditions need to be checked for people with iron-deficiency anemia. If they continue to receive treatment for the anemia, support may be provided to improve their dietary habits or physical activity, as needed, in collaboration with their treating physician. If the subject discontinues the necessary treatment at their own discretion, they are advised to undergo a detailed examination at a hospital.
8	Are you currently a habitual smoker? (* "A current habitual smoker" is defined as a person who has smoked a total of 100 cigarettes or more, or has a history of smoking for more than 6 months, and has been smoking for the past one month.)	● Smoking is an independent risk factor for arteriosclerosis. ● Smoking increases the risk of abnormal laboratory results, including increased blood glucose, increased serum triglyceride or LDL cholesterol, and decreased HDL cholesterol[*3, *4]. ● According to a Japan Public Health Center-based prospective study (JPHC study), males and females currently smoking more than 20 cigarettes a day have 1.4 times and 3.0 times the risk of type 2 diabetes, respectively, as compared to nonsmokers [*5]. ● According to a 14-year followup of a study(NIPPON DATA 80), male smokers consuming less than a package of cigarettes and those consuming more than 2 packages of cigarettes per day have a 1.5- and 2.2-fold greater risk of dying from stroke, respectively, as compared to male nonsmokers. Further, the same groups have a 1.5- and 4.2-fold greater risk of dying from ischemic heart disease, respectively, as compared to male nonsmokers [*6]. ● A combination of smoking and metabolic syndrome contributes to further aggravation of arteriosclerosis. Smokers with metabolic syndrome have a 4- to 5-fold higher risk of cerebral infarction or myocardial infarction, as compared to nonsmokers without

		metabolic syndrome [*7]. ● Persons who reported being a current habitual smoker (selected "Yes"), depending on their intention to refrain from smoking, should be provided with advice/information on quitting smoking on the day of the medical checkup and through health guidance after the medical checkup. At their request, a list of smoking cessation clinics can be provided. ● Persons who selected "No" may include those who refrained from smoking in the past, as well as those who may have stopped recently. This information may be obtained by modifying this item or asking follow-up questions. Their success in quitting smoking should be appreciated, and they should be encouraged to continue to refrain from smoking.
9	Has your body weight increased by 10 kg or more since the age of 20 years?	● Weight gain due to an erratic lifestyle may be indicative of energy intake that exceeds energy consumption (10 kg weight gain = 70,000 kcal). This question allows recognition of disturbed energy intake/consumption balance. ● The more weight gained, the higher the prevalence of diabetes/ hypertension. ● According to a study on Japanese people comparing those who gained less than 5 kg weight for about 30 years after the age of 20 with those who gained more than 5 kg weight during this period, men who gained more than 5 kg weight had a 2.61-fold greater risk of developing diabetes and women had a 2.56-fold greater risk of developing diabetes[*8].
10	Have you performed exercise with slight sweating for 30 minutes or more, at least twice a week, for more than one year?	● It has been suggested that regular/continuous practice of exercise programs with slight sweating, including fast walking, bodily exercise, jogging, running, swimming, and ball games (activities with the exercise intensity exceeding 3 METs), at more than 4 METs·hour/week (for more than 60 minutes a week), decreases the risk of developing lifestyle-related diseases and the possibility of dying from them by 12%[*9]. ● To limit the exercise programs to those with an intensity just exceeding 3 METs (i.e., those with the intensity of about 4 METs), the subjective impression of "slight sweating" was added to this item. ● If subjects selected "No," what effort they make to practice exercise and what risk they have for lifestyle-related disease need to be examined, and appropriate support should be provided so that they

		can select simple exercises for beginners[*9]. ● To prevent accidental cardiovascular incidents or injuries during exercise, exercise programs with an intensity of 6 METs or less, which cause the minimum amount of subjective "stress," should be recommended in the early stage of health guidance.
11	Do you walk, or engage in some physical exercise equivalent to walking, for one hour or more a day?	● To be considered as standard physical activities, activities with intensity exceeding 3 METs should be practiced at 23 METs·hour/week[*9]. Thus, standard activities include labor work, domestic work, transference, and exercises. Thus, a subject should engage in walking or other physical activities with an intensity equivalent to that of walking for more than 60 minutes a day, even if it is divided into several shorter periods of exercise within the day. ● It has been suggested that an increase in physical activity by 10 minutes a day contributes to decrease in the risk of lifestyle-related diseases by about 3%[*9]. ● If the subject selects "No" for this item, their exercise habits and risks of lifestyle-related disease need to be examined, and appropriate support should be provided so that they can select simple exercises for beginners[*9].
12	Do you walk faster than people who are of nearly the same age and the same sex as you?	● Through this item, the physical strength or activity of the subject concerned can be evaluated. ● One study evaluated subjects' physical strength by asking if they had as much physical strength as the people of nearly the same age and the same sex. Findings revealed that, compared to those who considered themselves stronger than the others, those who considered themselves to have poorer physical strength had a 3- to 4-fold greater risk of developing cardiovascular diseases and possibility of dying from cardiovascular diseases in the future. ● Further, it has been shown that if the physical strength of a subject exceeds the average physical strength (maximal oxygen uptake) of people of their sex and age, their risks of developing lifestyle-related diseases and the possibility of dying from them in the future are lower. ● It has been suggested that daily walking speed is related to maximal oxygen uptake, and that the risk of developing lifestyle-related diseases and the possibility of dying from them is 20-30% lower in those who walk faster. ● If a subject selected "No" for this item, they may have some physical problems, including pain in the feet,

		low back pain, and decreased motor function, in addition to limited physical strength. In such cases, their exercise habits and their risk of lifestyle disease should be examined, and relevant support should be provided.
13	Did you experience a weight gain/loss of 3 kg or more in the past year?	● The fluctuation of body weight in the past year reflects a change in the energy balance, likely due to a change in lifestyle/environment. ● It should be confirmed whether the subject's body weight increased/decreased by 3 kg or more. Then, appropriate health guidance should be provided. ● In the case of a weight loss of more than 3 kg, it should be confirmed if this change is due to an improvement in lifestyle. If the change is not the result of lifestyle improvements, the possibility of weight loss due to pathological conditions, including malnutrition resulting from loss of appetite or change in dietary environment, malignant neoplasm, or hyperthyroidism, should be examined. ● In the case of a weight gain of more than 3 kg, it should be examined if this acute change is due to a change in living environment, or if the body weight increased gradually year by year. These possibilities should be sufficiently considered before determining the target body weight.
14	Do you eat faster than others do?	● According to a study conducted in Japanese people, eating speed is associated with the degree of obesity (BMI)[*10]. ● The percentage of people who eat fast is higher in obese people (BMI $\geq$ 25.0 kg/m^2) than in low-weight people (BMI < 18.5 kg/m^2) and normal-weight people (BMI 18.5 kg/m^2 to 25.0 kg/m^2)[*11]. ● Compared to people who eat slowly, those who eat fast are at about twice the risk of developing diabetes[*12]. ● If people select the response "faster" and are predisposed to obesity, it should be confirmed if they have some unavoidable working or living condition causing this situation, and sufficient sympathy should be expressed. Then, effective methods must be devised using a collaborative approach and appropriate support should be provided to address their situation. ● These methods include "understanding the importance of repeated chewing," "making mealtimes pleasant with conversation," "avoiding swallowing food with soup," and "increasing the consumption of

		vegetables.”
15	Do you eat dinner within 2 hours before sleep, at least three times a week?	● According to a report, in a medical checkup conducted one year after initial assessment, people who changed their response from “Yes” to “No”; they had refrained from eating dinner within 2 hours before sleep, achieved decreased abdominal circumferences and increased HDL cholesterol levels [*13]. ● If a subject selects the response “Yes” and is predisposed to obesity, it should be confirmed if they have some unavoidable working or living condition causing this situation, and sufficient sympathy should be expressed. Then, effective methods must be devised using a collaborative approach and appropriate support should be provided to address their situation. ● In this case, bedtimes should not be extended, and the intake of energy or carbohydrate before sleep should be controlled by eating dinner earlier or adding snacks effectively.
16	Do you eat any snacks after dinner (a bedtime snack, other than three regular meals) three times or more a week?	● According to a survey, obese people tend to eat snacks after dinner, more frequently than normal-weight people[*14]. ● In a medical checkup that was conducted one year later, people who changed their response from “Yes” to “No”, i.e. they no longer engaged in snacking after dinner, achieved weight loss according to a report [*13]. ● If a subject selected “Yes” and is predisposed to obesity, it should be confirmed if they have some unavoidable working or living condition causing this situation, and sufficient sympathy should be expressed. Then, effective methods must be devised using a collaborative approach and appropriate support should be provided to address their situation. . ● These supportive methods include an approach based on behavioral science. For example, the concerned subject is instructed to maintain a diary and record the time they snack and the contents of the snack. In this manner, they become aware of how often they engage in snacking and recognize the necessity for improving their eating behavior.
17	Do you miss breakfast three times or more a week?	● In medical checkups conducted one year after initial assessment, people who changed their response from “Yes” to “No”; they do not miss breakfast for more than three times a week, achieved decreased LDL cholesterol level according to a report[*13]. ● If a subject selects “Yes” for this item, it should be confirmed if they have some unavoidable working or

		living condition causing this situation, and sufficient sympathy should be expressed. Then, effective methods must be devised using a collaborative approach and appropriate support should be provided to address their situation. ● Sufficient consideration should be given to their bedtime and other situations including timing of eating dinner (and subsequent snacks). Then, an environment in which they want to eat breakfast should be created. ● For example, breakfast should be prepared with due consideration of volume and balance. However, the stress associated with preparing breakfast should be reduced by recommending a rather simple breakfast.
18 19	How often do you drink alcoholic beverages (sake, distilled spirit, beer, whiskey, wine, etc.)? How much do you drink in a day?	● Alcohol consumption is linked to several health problems. It is known that the risk of such problems (e.g., hypertension, cerebral hemorrhage, hyperlipidemia) has a nearly linear positive relationship with mean daily consumption of alcoholic beverages. The overall mortality and risks of cerebral infarction and ischemic heart disease do not necessarily increase in a linear manner with an increase in alcoholic beverage consumption. However, people who drink alcoholic beverages beyond a certain volume are reported to be at a higher risk of developing these pathological conditions. ● By integrating the responses to items 18 and 19, the nature of alcohol consumption can be quantified. ● For instance, a subject who selects “Every day” or “Occasionally” for item 18, and “1–2 small bottles of sake” or the options indicating more alcohol consumption in item 19, is highly likely to have a “drinking habit that contributes toward a higher risk of lifestyle-related diseases”, as defined in Health Japan 21 (2nd edition). According to this source, “a drinking habit that contributes toward a higher risk of lifestyle-related diseases” is defined as to drink mean daily pure alcohol consumption: ≥ 40 g (males), ≥ 20 g (females). To cope with these cases, please refer to the appendix of Volume 3 of this program, reexamine the nature of the subject’s alcohol consumption (using the AUDIT+), and attempt to provide appropriate support for reducing alcohol consumption (brief intervention++). + AUDIT (alcohol use disorders identification test): The nature of alcohol consumption is investigated and scored by using a self-administered

		questionnaire. If their total score ranges from 8 to 14 points, the subject is advised to receive support for reducing alcohol consumption (brief intervention). [++] Support for reducing alcohol consumption (brief intervention): In the initial interview, the person in charge of the health guidance and the concerned subject check his/her current alcohol consumption. He/she is advised to gather more knowledge about the health problems resulting from drinking. Then, a concrete goal for the control of alcohol consumption, and the method for controlling the same, is examined. The concerned subject is advised to maintain a "diary" to control his/her drinking, and bring it when he/she comes to the health guidance, generally scheduled about 2–4 weeks later (there is no specified or recommended duration for the interval between two health guidance programs). In this manner, the person in charge of the health guidance and the concerned subject can reflect on his/her recent drinking behavior. ● People who select "Rarely (I do not drink)" may include those who have stopped consuming alcohol. Generally, they refrain from consuming alcohol because of their health problems (certain diseases). According to a cohort study, the risk of mortality is extremely high in the people who stopped drinking[*15]. Therefore, it should be checked if those who picked this response include those who stopped drinking. The reasons for discontinuation of alcohol consumption should be explored and appropriate health consultation programs should be provided for them.
20	Do you sleep well and get a sufficient amount of rest?	● A subject who selects "No" is likely to have a problem with either their "quantity" or "quality" of sleep. ● If a subject does not have sufficient quantity or length of sleep, it should be confirmed if this is due to their unavoidable working or living conditions and. Then, appropriate support should be provided so that sufficient length of sleep can be assured. ● If a subject has any problem with quality of sleep, you might refer to the Sleep Guideline for Health Promotion, "Seven Rules for Comfortable Sleep," and appropriate support should be provided. ● An obese subject may suffer from sleep apnea syndrome (SAS), a common complication of obesity. He/she should be checked for daytime sleepiness,

		snoring, and excessive consumption of coffee. Weight control is effective in treating SAS. Therefore, they should be encouraged to reduce their weight. Information regarding improvement of sleep, such as weight control, use of a mouthpiece, or treatment using continuous positive airway pressure (CPAP), and seeking medical attention should be provided as needed. ● A subject who selects "No" is likely to unwilling to improve their dietary habits/lack of exercise. They should not be urged to determine their target body weight, but should be informed of the close relationship between lack of sleep or insomnia and depression or lifestyle-related diseases. In this manner, support for ensuring sufficient quality and quantity of sleep should be provided.
21	Do you intend to improve your lifestyle, including fitness and dietary habits?	● This item is intended to assess the stage of behavior change (preparation stage) at the time of health guidance. People's response to this item can be utilized to provide the support appropriate for their preparation stage, based on Prochaska's theoretical model of behavior change. ● Some people may change their attitudes after the interview. Therefore, the stage of people who understood the medical checkup results should be reexamined in a later interview. ● Even if a subject selects "I do not intend to improve my lifestyle," they may change their attitude after the health guidance and their willingness to improve habits may increase. Therefore, it is important to carefully examine people's attitudes before excluding them from requiring health guidance. ● If people report that they have started improving their lifestyle [i.e., are in (4) action stage or (5) maintenance stage], how they try to improve, how long this improvement lasts, and how they recognize the effect of improvement should be examined and appreciated. Then, they should be informed of the importance of continuous effort. They may take an excessively difficult approach or may find it difficult to maintain these lifestyle changes. In this case, appropriate action, including reconsidering their goal, should be taken. ● If people are in the preparation stage (i.e., stage 3), they should be set objectives that can be achieved easily and encouraged by providing some tools at the right time so that they can improve their lifestyle.

		● If the subject concerned is in the contemplation stage (getting ready; i.e., stage 2), they should be informed of the benefits of improving one's lifestyle and of the efficacy of reasonable methods. For example, a mild decrease (3–4%) in body weight results in an improvement in laboratory results[*16]. ● If the subject concerned is in the precontemplation stage (not ready; i.e., stage 1), they should be informed of the fact that their present lifestyle may result in the development of lifestyle-related diseases. Further, be aware that, among people who selected "I do not intend to improve my lifestyle," there will be a variety of reasons for this selection, including the notion that further improvement is impossible because a good lifestyle has already been achieved. Therefore, the subject's attitude towards lifestyle improvement should be examined. For instance, the concerned subject could be asked about their current efforts to promote health. The physician in charge of health guidance should sympathize with subjects who finds it difficult to change their behavior, and help them identify the factors that are preventing behavior change. That is, the concerned subjects should be encouraged to understand their present condition
22	Do you utilize health guidance services to improve your lifestyle, if available?	● Persons who respond with "No" may do so because of the following reasons: they do not like to receive instructions; they prefer their own way of addressing the situation; they have already received instructions; or they do not have the time to avail themselves of the health guidance services. ● Even if people who respond with "No" and are reluctant to receive health guidance, they may change their attitudes after knowing their medical checkup results. Therefore, sufficient consideration should be given to their medical checkup results and their readiness levels, and appropriate support should be provided. ● A study results revealed that the benefit of active support was different between people who intend to seek such support and those who do not[*17]. Therefore, the fact that a collaborative attempt at active support differs from conventional "instruction" should be made clear to people who require health guidance.

[References]

*1 Japan Atherosclerosis Society “Japan Atherosclerosis Society (JAS) Guidelines for Prevention of Atherosclerotic Cardiovascular Diseases 2012”

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*14 1997 National Nutrition Survey

*15 Tsubono Y. JAMA. 2001; 28: 1177-1178

*16 “Influence of the activities aimed at preventing lifestyle diseases/disease management on the health index and its effect on assurance of reasonable medical expenses.” Comprehensive research project for controlling lifestyle-relateddiseases including cardiovascular diseases/diabetes, supported by a 2011 Health and Labour Sciences Research Grant (Leader: Tsushita K)

*17 “Influence of the activities aimed at preventing lifestyle-related diseases/disease management on the health index and its effect on assurance of reasonable medical expenses.” Comprehensive research project for controlling lifestyle-related diseases including cardiovascular diseases/diabetes, supported by a 2012 Health and Labour Sciences Research Grant (Leader: Tsushita K)

Separate Form 4

Methods and considerations for medical checkups and laboratory tests

Medical checkups and laboratory tests should be conducted according to the following instructions:

(1) Consumption of food or liquid and physical exercise before medical checkup

a. Alcohol consumption and heavy physical exercise should be avoided the day before and of the medical checkup.
b. When the medical checkup is scheduled in the morning, the consumption of any food or liquid, except for water, is not permitted for 10 hours before the medical checkup. This is because the consumption of food or liquid at less than 10 hours before laboratory tests may affect the blood glucose and serum triglyceride levels.
c. When the medical checkup is scheduled in the afternoon, the subject undergoing the examination is allowed to eat a light breakfast, even if HbA1c is to be tested. However, they are advised not to consume any food or liquid, except for water, after breakfast, until after the medical checkup.

(2) Measurement of abdominal circumference

a. Abdominal circumference is measured at the navel, in the upright position, during mild expiration.
b. In case of a downward dislocation of the navel resulting from marked accumulation of fat, the abdominal circumference is measured at the midpoint between the lower margin of the rib and the superior anterior iliac spine.
c. For more details, refer to the website of the National Institute of Health and Nutrition (http://www0.nih.go.jp/eiken/info/kokucho.html).

(3) Measurement of blood pressure

a. In principle, blood pressure is measured twice and the mean is used as the final measurement. However, depending on the measurement conditions, the result of one measurement is acceptable.
b. The Japanese Association for Cerebro-cardiovascular Disease Control published a handbook detailing this measurement method (‘Handbook for Preventing Cerebro-cardiovascular Diseases’). For a brief overview, refer to the website of the association (http://www.jacd.info/method/index.html).

(4) Blood lipid examination and liver function test

a. In general, a blood collection tube with a separating agent is used.

b. The collected blood sample should be centrifuged immediately. Ideally, measurement should be conducted within 24 hours from the time of collection of the sample.

If the blood sample cannot be handled in this manner, the blood collection tube should be stored in the refrigerator or at room temperature. The blood sample should be centrifuged within 12 hours.

c. The serum should be refrigerated until measurement. It should be analyzed within 72 hours after collection.

d. The visible absorption spectrophotometry or ultraviolet absorption spectrophotometry should be used for blood lipid examination. Only if the blood sample is collected in the fasting state, total cholesterol is measured, and the level of triglycerides is below 400 mg/dL, LDL cholesterol level can be estimated with the Friedwald equation.

e. In the liver function test, AST (GOT) and ALT (GPT) are measured by using ultraviolet absorption spectrophotometry, while the γ-GT (γ-GTP) is measured by using visible absorption spectrophotometry.

(5) Blood glucose test

Blood glucose level is measured by using one of the following methods. If a blood sample cannot be collected in the fasting state, the HbA1c measure is used.

a. Fasting blood glucose test

1. It should be confirmed that the blood was collected in fasting status. The fasting blood glucose level is defined as measured glucose level from a blood sample taken after a fast of more than 10 hours.
2. Blood collection tubes containing sodium fluoride (sample tubes for blood glucose test) should be used.
3. The tube containing the blood sample is gently inverted 5–6 times for mixing.
4. The mixed blood sample is stored in the refrigerator. Ideally, the blood sample should be centrifuged for measurement within 6 hours after collection. If this is not possible, it should be centrifuged within a maximum of 12 hours after collection.
5. The plasma collected by centrifugation is stored in the refrigerator until measurement. It should be analyzed within 72 hours after collection.
6. Potentiometry, visible absorption spectrophotometry, or an ultraviolet absorption spectrophotometry is used for measurement.

b. HbA1c test

1. Blood collection tubes containing sodium fluoride (sample tubes for blood glucose test) or ethylenediaminetetraacetic acid (EDTA) should be used.
2. The tube containing the blood sample is gently inverted 5–6 times for mixing.
3. The mixed blood sample is stored in the refrigerator.
4. The collected blood sample should be analyzed within 48 hours.
5. The immunological method, high-speed liquid chromatography (HPLC), or the enzyme method is used for measurement.

(6) Test for sugar and protein in the urine

a. A midstream urine sample is collected.
b. Ideally, the urine sample should be tested with the strips within 4 hours after collection. However, if this is not possible, the urine is transferred to a special, sealed container that can be stored until testing. If stored at room temperature, it should be tested within 24 hours from collection. If stored in the refrigerator, it should be tested within 48 hours from collection.
c. The Japanese Association for Cerebro-cardiovascular Disease Control published a handbook detailing these measurements and their standards for judgment ('Handbook for Preventing Cerebro-cardiovascular Diseases'). For a brief overview, refer to the website of the association (http://www.jacd.info/method/index.html).

(7) Detailed laboratory tests

1. Anemia test
   a. Blood collection tubes containing ethylenediaminetetraacetic acid (EDTA) should be used.
   b. After blood collection, the EDTA should be dissolved in the blood collection tube.
   c. The blood sample should be mixed and stored at room temperature. It should be tested within 12 hours of collection.

2. ECG
   a. A standard resting 12-lead ECG should be traced.
   b. The Japanese Association for Cerebro-cardiovascular Disease Control published a handbook detailing this examination method and its standards for judgment ("Handbook for Preventing Cerebro-cardiovascular Diseases"). For a brief overview, refer to the website of the association (http://www.jacd.info/method/index.html).

3. Funduscopy
   a. A handheld, head-mounted, or fixed electronic ophthalmoscope or fundus camera is used to

conduct a funduscopy.

b. The Japanese Association for Cerebro-cardiovascular Disease Control (http://www.jacd.info/method/index.html) published a handbook detailing this examination method and its standards for judgment ("Handbook for Preventing Cerebro-cardiovascular Diseases"). The Osaka Center for Cancer and Cardiovascular Diseases Prevention (formerly the Osaka Medical Center for Health Science and Promotion) (http://www.osaka-ganjun.jp/effort/cvd/gantei/) also published the "Comprehensive Funduscopy for Medical Checkup." For a brief overview, refer to their websites.

Separate Form 5

Levels of health guidance and medical treatment recommendations for medical checkup results

No	Test code (JLAC 10)	Laboratory test	Level of health guidance	Level of medical treatment recommendation	Data type	Unit	Examination method	Remarks
1	9A755000000000001 9A752000000000001 9A751000000000001	Systolic BP	130	140	Numerical value	Mm Hg	3: Others 2: 2nd measurement 1: 1st measurement	A mean or the most reliable value other than the "1st" and "2nd" measurements should be recorded.
2	9A765000000000001 9A762000000000001 9A761000000000001	Diastolic BP	85	90	Numerical value	Mm Hg	3: Others 2: 2nd measurement 1: 1st measurement	A mean or the most reliable value other than the "1st" and "2nd" measurements should be recorded.
3	3F015000002327101 3F015000002327201 3F015000002399901	Triglycerides	150	300	Numerical value	mg/dL	1: Visible absorption spectrophotometry (enzyme colorimetric assay/glycerol elimination) 2: Ultraviolet absorption spectrophotometry (enzyme colorimetric assay/glycerol elimination) 3: Others	Judgment is based on measurement in the fasting state. Judgment is based on measurement in the fasting state.
4	3F070000002327101 3F070000002327201 3F070000002399901	HDL cholesterol	39	34	Numerical value	mg/dL	1: Visible absorption spectrophotometry (direct method (non-precipitation method) 2: Ultraviolet absorption spectrophotometry (direct method (non-precipitation method) 3: Others	
5	3F077000002327101 3F077000002327201 3F077000002399901	LDL cholesterol	120	140	Numerical value	mg/dL	1: Visible absorption spectrophotometry (direct method (non-precipitation method) 2: Ultraviolet absorption spectrophotometry (direct method (non-precipitation method) 3: Others	Total cholesterol level is measured using the fasting blood sample, and LDL cholesterol is estimated with the Friedwald equation.
6	3D010000001926101 3D010000002227101 3D010000001927201 3D010000001999901	Fasting blood glucose	100	126	Numerical value	mg/dL	1: Potentiometry (glucose oxidase electrode method) 2: Visible absorption spectrophotometry (glucose oxidase method) 3: Ultraviolet absorption spectrophotometry (hexokinase method, glucokinase method, glucose dehydrogenase method) 4: Others	
7	3D046000001906202 3D046000001920402 3D046000001927102	HbA1c (NGSP)	5.6	6.5	Numerical value	%	1: Latex agglutination turbidimetry (immunological method)	Number to one decimal place Number to one decimal

	3D046000001999902						2: HPLC (instable fraction elimination HPLC method) 3: Enzyme method 4: Others	place Number to one decimal place Number to one decimal place
8	3B035000002327201 3B035000002399901	AST (GOT)	31	51	Numerical value	U/L	Ultraviolet absorption spectrophotometry (JSCC standardization compatible method) 2: Others	
9	3B045000002327201 3B045000002399901	ALT (GPT)	31	51	Numerical value	U/L	Ultraviolet absorption spectrophotometry (JSCC standardization compatible method) 2: Others	
10	3B090000002327101 3B090000002399901	γ-GT (γ-GTP)	51	101	Numerical value	U/L	Ultraviolet absorption spectrophotometry (IFCC (JSCC) standardization compatible method) 2: Others	
11	2A030000001930101	Hemoglobin	13.0 (males) 12.0 (females)	12.0 (males) 11.0 (females)	Numerical value	g/dL	Automated hemocytometer	

*1and 2: Data are based on the standards specified in “Guidelines for the Management of Hypertension,” created by the Japanese Society of Hypertension.

*3–5: Data are based on the standards specified in “Guidelines for Prevention of Atherosclerotic Cardiovascular Diseases,” created by the Japan Atherosclerosis Society, and “Manual for Medical Checkups Specified by the Health and Medical Service Act for the Aged” (*related to the former “Medical Service Act for the Aged”).

*6 and 7: Data are based on the judgment standards specified in “Treatment Guide for Diabetes,” edited by the Japan Diabetes Society.

*8–10: Data are based on the position document of the liver function research team of the Japanese Society of Gastroenterology.

*11: Data are based on the standards specified in WHO criteria for anemia and the “Guidelines for Judgment of Complete Medical Checkup Results and Follow-up Guidance,” created by the Japan Society of Ningen Dock.

* The routine examination methods that assure traceability covering more than 90% of each laboratory test are listed.

* The above laboratory tests and those not included in the above table are coded with JLAC-10 codes.

* Since 2013, NGSP level has been used to express HbA1c in place of conventional the JDS levels. The following formulas can be used for conversion from NGSP level to JDS level, and from JDS level to NGSP level.

JDS level (%) = 0.980 × NGSP level (%) - 0.245%

NGSP level (%) = 1.02 × JDS level (%) + 0.25%