

Content of Health checkup

The name in parentheses is the abbreviated name of each health checkup.

1. General health checkup

(Ordinary A) Subject people: Students, research students, specially registered students, special research students, special auditors, foreign students, special or joint researchers, faculty and staff members who are younger than 35 years old or between 36 and 39 years old, non-regular staff members

Content: Interview and internist medical examination (medical history, work history, and examination of subjective and objective symptoms)

Examination of height, weight, vision, and hearing (conversational method)

Chest X-ray examination (indirect radiography)

Blood pressure measurement

Urine examination (glucose, protein, occult blood, urobilinogen)

Blood examination

Peripheral blood examination (number of red blood cells, hemoglobin content, hematocrit value, number and percentage of white blood cells, number of platelets)

Examination of liver functions (GOT, GPT, ALP, γ GTP)

Examination of lipids (total cholesterol, HDL/good cholesterol, LDL/bad cholesterol, neutral fat)

Examination of kidney functions (creatinine)

Gout examination (uric acid)

(Ordinary B) Subject people: Faculty and staff members who are 35 years old, faculty and staff members who are 40 years old or older

Content: In addition to "Ordinary A,"

Measurement of abdominal circumference (metabolic syndrome)

Blood examination: Blood sugar level, hemoglobin A_{1c}

Hearing test (audiometer method)

Electrocardiography

Gastric X-ray examination (indirect radiography)

Examination of fecal occult blood (human hemoglobin method)

Examination of sputum cells (Smoking index = A person for whom the number of cigarettes smoked per day multiplied by the number of years of smoking is 600 or more, or a person who had bloody sputum in the last six months)

2. Special (RI/X-ray) health checkup (Conducted twice a year; the first time is conducted at the time of the general health checkup in May, and the second time

an interview, examination, and blood examination will be conducted in November.)
(RI/X) Subject people: People who are registered as people who conduct radiation work

Content: Interview and examination (assessment of history of exposure to radiation, eye examination related to cataracts, skin examination)

Blood examination

Peripheral blood examination (number of red blood cells, hemoglobin content, hematocrit value, number and percentage of white blood cells, number of platelets)

Examination of liver functions (GOT, GPT, AI-P, γ GTP)

3. Special (genetic recombination) health checkup (conducted once a year, at the time of the general health checkup in May)

(Recombination) Subject people: People who are registered as people who engage in genetic recombination experiments

Content: Interview (the period of being involved in genetic recombination experiments, examination of subjective symptoms that newly appeared after engaging in a DNA experiment)

Blood examination

Peripheral blood examination (number of red blood cells, hemoglobin content, hematocrit value, number and percentage of white blood cells, number of platelets)

Examination of liver functions (GOT, GPT, AI-P, γ GTP)

4. Special (organic solvent) health checkup (conducted twice a year; The first time is conducted at the time of the general health checkup in May, and the second time an interview, examination, and blood examination will be conducted in November.)

(Organic) Subject people: People who are involved in experiments using organic solvents and for whom an industrial physician has judged that it is necessary based on the frequency of use and the amount handled

Content: Interview (work history, medical history due to organic solvents, and examination of subjective symptoms and objective symptoms)

Blood examination (only for people who are subject to the specified organic solvents)

Peripheral blood examination (number of red blood cells, hemoglobin content, hematocrit value, number and percentage of white blood cells, number of platelets)

Examination of liver functions (GOT, GPT, AI-P, γ GTP)

Urine analysis (proteins and, for people who are subject to the specified organic solvents, the amount of metabolites for the organic solvents)

Ophthalmoscopy (only for people who are subject to the specified organic

solvents)

5. Special (specific chemical substances) health checkup (conducted twice a year; The first time is conducted at the time of the general health checkup in May, and the second time an interview, examination, and blood examination will be conducted in November.)

(Specific chemical substances) Subject people: People who are involved in experiments using specific chemical substances and for whom an industrial physician has judged that it is necessary based on the frequency of use and the amount handled

Content: The examination and examination matters that were stipulated for each specific chemical substance

Interview (work history, work conditions, medical history due to organic solvents, and examination of subjective symptoms and objective symptoms)

Examination (Observation of skin, observation of nasal cavity, and examination of cadmium accumulation in teeth, enlarged liver or spleen, and grip strength)

Blood pressure measurement

Measurement of lung capacity

Urine examination (glucose, protein, occult blood, urobilinogen, urinary sediment)

Blood examination

Peripheral blood examination (number of red blood cells, hemoglobin content, hematocrit value, number and percentage of white blood cells, number of platelets)

Examination of liver functions (GOT, GPT, Al-P, γ GTP)

6. Other

A special (driver) health checkup will be conducted for people who are involved in driving vehicles, a special (food service) health checkup will be required for people who conduct food service work, and reports of those examinations will be received.

7. Health checkup at the time of an overseas trip (for trips of six months or longer)

Before a trip and after a trip

- I. Examination of medical history and work history
- II. Examination of whether there are subjective symptoms or objective symptoms
- III. Examination of height, weight, abdominal circumference, visual acuity, and hearing
- IV. Chest X-ray examination and sputum examination
- V. Measurement of blood pressure
- VI. Anemia test

- VII. Examination of liver functions
- VIII. Examination of lipids in the blood
- IX. Blood sugar test
- X. Urine examination
- XI. Electrocardiography

Matters stipulated by the Minister of Health, Labour and Welfare

1. Abdominal imaging examination
2. Examination of the amount of uric acid in the blood
3. Examination of hepatitis B virus antibodies
4. Blood typing for ABO and Rh (only at times of dispatch)
5. Examination of fecal smear (only at times of returning to Japan)

When a trip of six months or more has been decided, please visit the Health Care Center as soon as possible. We also accept consultations about vaccinations.

7. Points for each examination

1) Measurement of abdominal circumference

2) Physical measurement (height and weight)

Ordinarily, BMI (Body Mass Index, physique index/body type index) is used as the judgment criterion for obesity, and BMI is sought by using the formula below based on height (meters) and weight (kilograms).

$$\text{BMI} = \text{Weight in kg} \div \text{Height in m}^2$$

Weight when BMI is 22.0 is the standard weight, when observed statistically that is the body type that is the least likely to become ill, and morbidity increases the more the number varies from the standard. Obesity is judged as stated below.

BMI	Judgment
Less than 18.5	Thin / Low weight
18.5 or more and less than 25	Standard
25 or more and less than 30	Obese
30 or more	Extremely obese

Notes: Previously, standard weight was sought by a formula called the Broca Index $\text{Standard weight in kg} = (\text{Height in cm} - 100) \times 0.9$ and, using that weight as 100%, the portion that exceeded that was indicated as a percentage and judgment was made for the degree of obesity. The judgment criteria for the degree of obesity based on that formula are as stated in the table below, but currently judgment by using BMI is used as the standard.

Judgment criteria	Too underweight	Somewhat underweight	Ordinary	Somewhat overweight	Overweight
Degree of obesity (%)	-20.0 or less	-19.9 to -10.0	-9.9 to 9.9	10.0 to 19.9	20.0 or more
BMI index	17.6 or less	17.7 to 19.8	19.9 to 24.1	24.2 to 26.3	26.4 or more

BMI of 18.5 to 25 (degree of obesity $\pm 10\%$) is normal, and BMI of 25 (degree of obesity 20%) or more is obese. Obesity causes lifestyle-related diseases of diabetes, high blood pressure,

hyperlipidemia, fatty liver, gout, and heart disease.

BMI of 18.5 (-20% degree of obesity) or less is underweight, but there are many factors related to the person's constitution, and there is not much need for concern. However, if 3–4 kg are suddenly lost in two to three months, there is suspicion of a metabolic endocrine disease such as Graves' disease or diabetes or a malignant disease such as cancer, and a detailed examination is necessary.

3) Visual acuity test

Decline in visual acuity causes fatigue of the eyes, dizziness, headaches, and decline of the ability to concentrate. If your naked-eye acuity is 0.5 or less, please consider wearing glasses.

4) Chest X-ray examination

This is the most powerful examination in a case of diagnosing diseases of the respiratory organs, particularly the lungs and the heart.

The whitish portion in the center of the frontal view is called the mediastinal space, and shadows in the mediastinal space give a good projection of the shape of the heart and the state of the aorta. The surrounding dark portion other than the mediastinal space is the pulmonary area. The things in the pulmonary area that look like tree branches are blood vessels. In the case of pulmonary tuberculosis, pneumonia, or lung cancer, abnormal images can be seen in the pulmonary area, and that is useful for diagnosis.

The shape of the heart indicates various characteristic shapes that are respective to cardiac hypertrophy, heart valve disease, and congenital heart disease.

5) Blood pressure measurement

The blood that is pushed out of the heart passes inside the arteries and flows throughout the entire body. At that time, a certain pressure is indicated inside the blood vessels. This is blood pressure. Blood pressure increases when the heart contracts, which is called systolic blood pressure or the highest (largest) blood pressure, and it decreases when the heart expands, which is called diastolic blood pressure or the lowest (smallest) blood pressure.

Measured blood pressure will be judged as stated below (The Japanese Society of Hypertension; 2000).

Classification	Systolic blood pressure in mmHg		Diastolic blood pressure in mmHg
Optimal blood pressure	Less than 120	and	Less than 80
Normal blood pressure	Less than 130	and	Less than 85
Normal hypertension	130–139	or	85–89
Mild hypertension	140–159	or	90–99
Moderate hypertension	160–179	or	100–109
Serious hypertension	Greater than or equal to 180 or		Greater than or equal to 110
Systolic hypertension	Greater than or equal to 140 and		Less than 90

6) Urine examination (glucose, proteins, occult blood): Ordinarily, all of these are negative.

For urobilinogen, + is normal.)

If urinary sugar is positive, diabetes is the disease that has the highest frequency, but it is not possible to diagnosis diabetes from this alone. A detailed examination using blood is necessary. If urinary protein is positive, the first things that will be suspected are kidney disease, which is represented by glomerular nephritis and nephrotic syndrome, and a urinary tract infection, which is represented by pyelonephritis and cystitis.

If urinary occult blood is positive, that is evidence that red blood cells are mixed in the urine (hematuria). Stones or tumors in the kidneys or urinary tract, nephritis, or cystitis will be suspected. Please avoid examination during, immediately before, or immediately after menstruation.

Urobilinogen is one way of conducting examination of liver functions and hemolytic diseases.

7) Peripheral blood examination

For a decline in the number of red blood cells, hemoglobin content (hemoglobin), or the hematocrit value, there will be suspicion of anemia. Anemia is caused by various factors, and therefore a more detailed examination is necessary. Alternatively, a high value is called polycythemia.

In an increase of the number of white blood cells, there is an increase in the responsiveness for infectious diseases of bacteria, and an increase in the tumor potential for leukemia. For that percentage, this will be made more detailed, and the reaction will also be made to an allergy observation. Alternatively, if the number of white blood cells decreases, resistance weakens.

For a decline of the number of platelets, there is a tendency to bleed.

8) Examination of liver functions

GOT (AST) and GPT (ALT) (transaminases) are enzymes that are included mainly in the liver, and they increase due to acute hepatitis, chronic hepatitis, fatty liver, alcoholic hepatopathy, cirrhosis of the liver, and hepatic tumors. In other cases, they may also increase due to myocardial infarction. Al-P (alkaline phosphatase) is created in the liver and is excreted within the bile. Therefore, if the flow of bile is hindered due to bile duct stones or a hepatic tumor, Al-P will increase. In other cases, they also increase due to hepatitis, cirrhosis of the liver, or bone diseases. If hindrance of the liver (fatty liver, etc.) occurs due to alcohol or medicine, γ GTP will increase. Even if excretion of bile is hindered, that increase can be seen.

9) Examination of lipids (total cholesterol, good HDL cholesterol, bad LDL cholesterol, neutral fat triglyceride)

Cholesterol is important as a component of cell membranes and a material for various hormones and bile. However, if there is too much cholesterol, it causes impediments such as arteriosclerosis and ischemic heart disease (angina pectoris, myocardial infarction). It increases due to excessive consumption of animal fat, diabetes, or excessive consumption of alcohol. Alternatively, if it is low, there is suspicion of serious hepatopathy or hyperthyroidism, and it may cause weakening of the blood vessels and cerebral hemorrhage.

HDL cholesterol works to remove cholesterol from peripheral systems, and therefore it is called **good** cholesterol. Accordingly, it is better for this value to be high.

LDL cholesterol contains a lot of cholesterol and is important for carrying it to each of the systems in the entire body, but if there is too much of it, surplus cholesterol will be stored in the cells, and arteriosclerosis will be caused in the blood vessels; therefore, LDL cholesterol is called **bad** cholesterol.

Neutral fat (triglycerides) increases due to excess consumption of calories (particularly sugar and fat) or excess consumption of alcohol. In addition, it is believed that neutral fat is one of the risk factors that cause acute pancreatitis.

Note: The quantitative relationship between total cholesterol, HDL cholesterol, LDL cholesterol, and neutral fat is: Total cholesterol = HDL cholesterol + LDL cholesterol + Neutral fat × 0.2.

Note: The examination criteria for hyperlipidemia are as stated below

Hypercholesterolemia	Total cholesterol	220 mg/dl or higher
High LDL cholesterol disease	LDL cholesterol	140 mg/dl or higher
Low HDL cholesterol disease	HDL cholesterol	Less than 40 mg/dl
High triglyceride (neutral fat) disease	Triglycerides (neutral fat)	150 mg/dl or higher

Recently, rather than total cholesterol, judgment based on the level of bad LDL cholesterol is made.

10) Examination of carbohydrate metabolism (blood sugar level, hemoglobin A1C)

The density (blood sugar level, blood sugar BS) of glucose in the blood increases by absorption from the intestines and by being created in the liver, while on the other hand, it is consumed by various systems of the body, such as muscles and the brain, and decreases. This balance is adjusted by insulin, which is a hormone that is secreted from the pancreas. Accordingly, if there is insufficient insulin, consumption of glucose in the blood will decrease, and blood sugar will increase. This is diabetes. The blood sugar level is affected by eating before the examination; therefore, the fasting blood sugar level (FBS), which is measured at a time of an empty stomach, is the fundamental rule.

Hemoglobin A_{1C} (HbA_{1C}) is a combination of hemoglobin (blood pigment) and glucose, and it is called glycohemoglobin. This production process is conducted slowly and continuously, that metabolism is related to the life span of red blood cells (120 days or four months), and it occupies a weight in which the past one month is 50% and the past two months are 40%. Accordingly, this examination value reflects the average blood sugar level of the one-to-two-month period before the examination. In contrast to FBS, this examination is not influenced by eating before the examination. In addition, even if FBS is normal, if HbA_{1C} is high there is a suspicion of diabetes. For a diabetic, this is an important index for knowing whether control is good or bad.

11) Examination of kidney functions (creatinine)

Creatinine is excreted from the kidneys in urine. If there is a hindrance to that excretion, creatinine stagnates in the blood and increases. If the creatinine value exceeds the upper limit for the ordinary value, kidney functions have declined to one-half their ordinary functions and it is a state of kidney function failure. Ordinarily, if it becomes 10 mg/dl or higher dialysis will be

necessary.

12) Gout examination (uric acid)

Uric acid value increases when a person has gout, is obese, consumes an excessive amount of alcohol, eats food that has a lot of purines (sardines, mackerel, or internal organs of fish or animals) or has a disorder of a kidney function.

13) Electrocardiography

This examination is essential for diagnosing arrhythmia, cardiac hypertrophy, cardiac infarction, angina pectoris, and cardiomyopathy.

14) Gastric X-ray examination

This examination is essential for diagnosing esophageal cancer, esophageal varices, esophageal ulcers, gastritis, gastric ulcers, gastric polyps, stomach cancer, and duodenal cancer.

15) Examination of fecal occult blood

This detects slight amounts of bleeding from the gastrointestinal tract that cannot be seen by the human eye. It is the most simple and useful examination for finding ulcers and cancer in the esophagus, stomach, duodenum, small intestine, and large intestine. Because cases of colorectal cancer are increasing, it can be said that this is an important examination.

16) Examination of sputum cells

Examination of sputum is a method of detecting lung cancer (particularly lung hilum cancer, which is difficult to discover by chest X-ray examination) by finding malignant cells.