Physical Examination

This test determines if you are obese or underweight based on your height and weight.

Abdominal Measurement - For men over 35 or with a BMI greater than 25

Examination for metabolic syndrome is done in conjunction with height and weight measurements. Abdominal measurement over the standard suggests the subject has a large amount of visceral fat. Even slightly elevated lipid, blood sugar, and blood pressure levels increase the probability of arteriosclerosis (hardening of the arteries) progressing and causing life-threatening conditions such as myocardial infarction (heart attack). If you have experienced sudden weight loss, you should pay attention to the possibility of metabolic/endocrine/digestive disorders, diabetes, and hormonal abnormalities.

Determining Body Mass Index (BMI)

BMI = weight (kg) ÷ (height (m) × height (m))

A BMI of 22 is said to be normal.

BMI	Evaluation
Less than 18.5	Underweight
18.5 - < 25	Normal Weight
25 - < 30	Obese (Class I)
30 - < 35	Obese (Class II)
35 - < 40	Obese (Class III)
40 or over	Obese (Class IV)

Diagnostic Criteria for Metabolic Syndrome

If (1) applies to you, and if two or more of (2)-(4) also apply to you, you will be tested for metabolic syndrome.

(1) Waist Circumference	Over 85 cm for men, Over 90 cm for women
(2) High Blood Pressure	Systolic blood pressure (maximum blood pressure) of 130 mmHg or higher, and/or a diastolic blood pressure (minimum blood pressure) of 85 mmHg or higher
(3) Dyslipidemia	Neutral fat level of 150 mg/dl or higher, and/or a high-density lipoprotein (HDL) cholesterol level of less than 40 mg/dl
(4) Hyperglycemia	Fasting blood sugar level of 110 mg/dl or higher

If you are listed as having pre-metabolic syndrome or metabolic syndrome:
Try to improve your lifestyle through diet and exercise. Drastic dietary restrictions and strenuous exercise can make you sick. Take notes on your daily food intake and time spent eating, and make time to reflect on it. If you eat dinner late, aim to have a large lunch and a light dinner. Also, try to increase the amount you walk every day (e.g., taking the stairs or walking to work). Observing the number of steps you take using a pedometer can be a guide for your amount of daily physical activity. We also recommend using a pedometer app on your cell phone or smartphone.

Blood Pressure

The pressure that the flow of blood exerts on blood vessels is called "blood pressure." The pressure exerted when the heart contracts and pumps blood is called the maximum blood pressure (systolic blood pressure), while the pressure when the heart stores the blood it will pump out is called the minimum blood pressure (diastolic blood pressure). A sphygmomanometer (blood pressure monitor) is used to measure maximum/minimum blood pressure for checking the function of the body's circulatory system.

Hypertension (High Blood Pressure)

Measurement of blood pressure is an essential test because even when blood pressure is high, there are often no subjective symptoms.
Continued hypertension damages the endothelium of blood vessels, leading to arteriosclerosis and loss of blood vessel elasticity, which can easily cause cerebral infarction (stroke), cerebral hemorrhage, angina pectoris (chest pain/discomfort), and myocardial infarction. Obesity, hyperglycemia, and lipid abnormalities further increase the risk of developing such complications associated with hypertension.
To determine if you have hypertension, your blood pressure will be taken several times on different days. If you are diagnosed with hypertension, you should review your basic lifestyle habits such as exercise and diet. Also, since blood pressure is easily affected by time of day, climate, exercise, stress, etc., it is important to measure your blood pressure at home every day to manage blood pressure yourself. Please keep a record of your blood pressure and consult with us for advice regarding your results.

Retest Criteria: systolic blood pressure of 140 mmHg or higher, and/or diastolic blood pressure of 90 mmHg or higher
Please get retested at the Medical Service Center. Depending on your result, we may refer you to a doctor.

Low Blood Pressure

Low blood pressure is not a disease in itself. However, if it remains lower than it should be, it can potentially affect your life in various ways.

Symptoms of low blood pressure include tiredness, fatigue, stiff shoulders, headaches, and lightheadedness. It is caused by impaired blood circulation, which prevents enough blood from reaching brain cells and extremities of the limbs, causing fatigue, dizziness and lightheadedness. Malnutrition due to unbalanced diet, stress, irregular lifestyle, and hormonal imbalance can also affect blood pressure.

Retest Criteria: systolic blood pressure of less than 80 mmHg

Try to improve your physical condition by reviewing your diet and incorporating light exercise into your everyday life. If symptoms such as fatigue persist, please have your blood pressure measured at the Medical Service Center. Depending on your result and symptoms, we may refer you to a doctor.

Systolic Blood Pressure (Maximum Blood Pressure) and Diastolic Blood Pressure (Minimum Blood Pressure)	
Normal Blood Pressure	Less than 120 and less than 80
Elevated Blood Pressure	120-129 and/or less than 80
High Blood Pressure	130-139 and/or 80-89
High Blood Pressure (Stage 1 Hypertension)	140-159 and/or 90-99
High Blood Pressure (Stage 2 Hypertension)	160-179 and/or 100-109
High Blood Pressure (Stage 3 Hypertension)	180 or higher and/or 110 or higher
Isolated Systolic Hypertension	140 or higher and less than 90

Urinalysis

If there is an abnormality in the kidneys or anywhere else in the body, this will affect the composition, properties, and quantity of urine. A urinalysis (urine test) is used to check for signs of abnormalities in the body.

If you have not had a urinalysis yet, please go to the Medical Service Center to have it done.

Proteinuria (Protein in Urine)

The nutrients in the blood are filtered through the glomerulus of the kidneys, with necessary nutrients being reabsorbed by the tubules and returned to the blood, and unnecessary parts being

discarded in the urine. Protein is necessary for the body and is almost undetectable in the urine of healthy people. If the amount of protein in the urine exceeds a certain level, the condition is called "proteinuria" and suggests there is an abnormality in the kidneys or urinary tract.
Even if there is no particular abnormality in the kidneys or urinary system, things like fever, extended periods of standing, exercise, or fatigue may cause a temporary positive result.

Retest Criteria: positive result (+)
Please collect an early morning urine sample and have it retested. If you wish to have your urine retested at the Medical Service Center, please come and pick up a urine sample collection container. If abnormalities are still found after retesting, you will need to see a doctor.

Urine Occult Blood (Blood in Urine)

Urine is checked for the presence of red blood cells to determine if there are any abnormalities in the kidneys and urinary tract. If there is a large concentration of red blood cells in the urine, it will be visibly red, but if there is only a small amount, it is not visible to the naked eye. The medical term for the presence of red blood cells in the urine is hematuria (blood in the urine), even if it is not visibly red.
Hematuria indicates that bleeding is occurring somewhere in the kidneys or urinary tract. A positive (+) result indicates potential cystitis (inflammation of the bladder) or diseases of the kidney/ureter. Furthermore, for women, when menstrual blood mixes with urine, this will cause a positive urine occult blood result. A positive result may also be caused by gynecological inflammation. To determine if it is just temporary blood in the urine, retesting is necessary.

Retest Criteria: positive result (+)
Please collect an early morning urine sample and have it retested. If you wish to have your urine retested at the Medical Service Center, please come and pick up a urine sample collection container. If abnormalities are still found after retesting, you will need to see a doctor.

Urinary Sugar (Sugar in Urine)

There is always a certain amount of glucose (blood sugar) in the blood. When there is too much glucose in the blood, this sugar leaks out into the urine. In a healthy person, this rarely occurs. However, even healthy people may temporarily test positive for sugar in urine after eating too many sweets or when they are under a lot of stress. Also, some people have "renal glycosuria", a genetic condition in which sugar often appears in urine. As renal glycosuria is not a disease, there is no need

to worry about it.
In order to determine whether it is organic urinary sugar or present due to genetics, retesting is necessary.

Retest Criteria: positive result (+)
Please collect a urine sample two hours after eating and have it retested. If you wish to have your urine retested at the Medical Service Center, please come and pick up a urine sample collection container. If abnormalities are still found after retesting, you will need to see a doctor.

Chest X-ray Examination

The most common diseases that this examination can detect are diseases of the lungs. If there is inflammation or tumor in the lungs, the lesion will appear whitish on the x-ray. In addition to the lungs, this examination also helps detect diseases of the heart/aorta as well as view the state of the bronchial tubes and esophagus. If there are any findings on the chest x-ray, a more comprehensive examination such as a chest CT scan is necessary.

Although levels of pulmonary tuberculosis are on the decline, several cases of tuberculosis are discovered among students, faculty and staff every year. As a faculty or staff member in charge of students, it is your responsibility to have a chest x-ray and be screened thoroughly every year.

If you are listed as requiring retesting or a comprehensive examination:
The doctor will explain the results of the chest x-ray at the Medical Service Center, issue a referral letter, and provide a chest x-ray image (CD).

If you are listed as having normal results:
Two doctors who provide medical checkups at Ritsumeikan University will check the images. A radiologist from the Medical Service Center will then check them again (triple check). Those with findings from their x-ray will be given priority for checking, after which the images of those with normal results will be reviewed. If there are any findings that are cause for questioning, we compare the x-ray with any stored images that we have to detect any abnormalities early. Even if your results have been determined to be normal, if we discover any such findings we may contact you by email at a later date.

Electrocardiogram (EKG)

Electrocardiogram waveforms show abnormalities in the rhythm of the heartbeat, any findings that

suggest ischemia (deficient supply of blood to a body part), and any abnormalities in the heart muscle.
It also shows any diseases of the heart such as arrhythmia, angina pectoris, myocardial infarction, cardiomyopathy, cardiomegaly, myocarditis, pericarditis, as well as hypertension and arteriosclerosis. If it is determined that a comprehensive examination (such as a 24-hour electrocardiogram or echocardiogram (ECG)) is necessary, please be sure to undergo the examination.

If you are listed as requiring a comprehensive examination:
Please consult with a cardiologist.
If you are instructed that a 24-hour electrocardiogram is required, please make an appointment. Once a 24-hour electrocardiogram has been taken, a cardiologist will examine you again at a later date. At that time, an echocardiogram may be performed at the doctor's discretion. If further examination is required, a referral letter will be issued.

Fecal Occult Blood Test (FOBT)

This screening test is effective for early detection of colorectal cancer. Collected stool is checked for the presence of blood. If a test is positive (+) even only once, colorectal (colon/rectal) cancer or polyps are suspected to be the cause.
Even if you do not test positive, we suggest you have a colonoscopy at regular intervals if you have a history of colorectal disease(s).

Comprehensive examination criteria: positive result (+)
Even if a positive (+) result is only found once, a colonoscopy is required. A Ritsumeikan doctor will provide an explanation and issue a referral letter.
If you go directly to an outside medical institution, please visit one that has a gastroenterology department and can perform a colonoscopy.

Blood Test

Blood samples are taken to monitor overall health and to help detect and prevent diseases in their early stages.

If you receive a result of a comprehensive examination or retesting is required for blood test, liver function, lipid metabolism, serum protein, glucose metabolism, renal/urinary metabolism, and prostate, or if you are undergoing the ABCD Gastric Cancer Risk Screening (Group B/C/D, and

Group A patients who are taking gastric acid suppressants (e.g., Omepral, Takepron, Pariet, etc.)):
The doctor will explain the results and ask you to retest on the same day or at a different time, if necessary. Please note that there may be cases where the patient will not be tested again, but will be followed up with after the examination.
A referral letter will be issued for cases that include testing that cannot be performed at the Medical Service Center, and cases that require detailed examination or specialized treatment.

Blood Test

White Blood Cells

White blood cells eliminate bacteria, viruses, and other foreign substances that enter the body. When you have an injury or inflammation, the number of white blood cells in the blood increases. On the other hand, if this number is low, your immune system may be weakened.

Red Blood Cells

Red blood cells receive oxygen from the lungs and transport it to cells throughout the body; these cells also receive carbon dioxide that is no longer needed by the cells and carry it to the lungs. A decrease in the number of red blood cells can cause anemia. On the other hand, when the red blood cell count increases, it can cause blood flow difficulties.

Hemoglobin

Hemoglobin is a red pigment found in red blood cells that binds to oxygen and transports it throughout the body. The most common test for anemia is to check how many grams of hemoglobin are in 100 ml of blood. If it is low, you are anemic.

Hematocrit

This indicates the proportion of red blood cells in the blood. As the number of red blood cells decreases, hematocrit naturally decreases as well.

Mean Corpuscular Volume (MCV)

This is the hematocrit value (volume) divided by the number of red blood cells; it is the average volume per red blood cell. MCV is useful for determining the size of red blood cells.

Mean Corpuscular Hemoglobin Concentration (MCHC)

This is the ratio of the amount of hemoglobin to the volume of each red blood cell, expressed as a percentage; it indicates the degree of hemoglobin concentration, i.e., hypochromic or hyperchromic.

Mean Corpuscular Hemoglobin (MCH)

This is the amount of hemoglobin in a given volume of blood divided by the number of red blood cells, which gives the average amount of hemoglobin per red blood cell.

Blood Platelet

Platelets thicken the blood to form clots and are important for stopping bleeding. If the number of platelets is low or their function is impaired, bleeding may occur easily or become difficult to stop.

Liver Function

Aspartate Aminotransferase (AST) and Alanine Transaminase (ALT)

Both AST (GOT) and ALT (GOP) are enzymes found in liver cells which play an important role in producing amino acids needed by the body. When liver cells break down, both of these enzymes leak into the bloodstream in large amounts, meaning that the degree of liver cell damage can be determined from the respective values. However, this amount may also rise temporarily after drinking alcohol or exercising as well as due to obesity or steroid use.

Alkaline Phosphatase (ALP)

ALP is an enzyme that breaks down phosphate compounds found in most organs, and is mainly produced in the liver, bones, and intestines. Since ALP in the liver is discharged into bile, it increases in the blood if there is an abnormality in the pathway of bile flow due to diseases of the liver or biliary system. It can also be elevated due to bone abnormalities.

Lactate Dehydrogenase (LDH)

LDH is an enzyme that works to convert glucose into energy in the body. It is found in most cells in the body, including blood cells and cells of the liver, kidneys, lungs, heart muscle, skeletal muscle, etc. When these organs or cells are damaged, it flows into the bloodstream in large amounts.

Gamma-Glutamyl Transpeptidase (γ-GTP)

Like AST (GOT) and ALT (GPT), γ-GTP (also known as GGT (gamma-glutamyl transferase) is one of the enzymes that break down proteins, and mainly becomes elevated in the blood when there is liver damage or poor bile flow. It rises when a fatty liver is caused by the excessive consumption of alcohol and sweet foods.

Lipid Metabolism

Total Cholesterol (TCH)

Cholesterol is essential for the maintenance of the body as it makes up cell membranes and blood

vessel walls, and is involved in the production of corticosteroids, sex hormones, and even bile. However, if there is too much cholesterol in the blood, it will speed up atherosclerosis (hardening of the arteries). As total cholesterol levels are affected by liver and kidney abnormalities as well as diabetes, this test can also provide clues to the status of these diseases.
In addition, cholesterol is related to female hormones, with postmenopausal women tending to have higher total cholesterol levels.

Triglycerides (TG)

Triglycerides are a type of lipid that serves mainly as an energy source in the body. If you consume too many carbohydrates, those that are not immediately used for energy will be stored as subcutaneous fat. Overeating and drinking are the most common causes of an increase in triglycerides, resulting in a high level of triglycerides in the blood. If you are malnourished, this level drops.

High-Density Lipoprotein (HDL) Cholesterol

HDL cholesterol is also known as “good cholesterol” because it collects excess cholesterol in peripheral tissues and returns it to the liver, thus reducing the deposition of cholesterol on blood vessel walls.

Low-Density Lipoprotein (LDL) Cholesterol

LDL cholesterol is also known as “bad cholesterol” because although it carries cholesterol from the liver to all parts of the body, if too much cholesterol is carried it can accumulate in blood vessels and causes atherosclerosis.

Serum Proteins

Total Protein

Although total protein is always maintained at a constant level in the body, it can fluctuate if there is an abnormality in liver or kidney function. Even healthy people can develop low protein levels due to inadequate nutritional intake if they have an unbalanced diet.

Glucose Metabolism

Blood Sugar (BS)

When you eat, the amount of sugar (glucose) in your blood increases. In a healthy person, the pancreas secretes a large amount of insulin that distributes sugar throughout the body, which results in the blood sugar level returning to normal about two hours after eating. However, if there is not enough insulin or if the pancreas is not working properly, blood sugar levels will remain high,

resulting in hyperglycemia (high blood sugar).

Hemoglobin A1c (HbA1c)

This test is used to get a rough idea of the average blood glucose level for the period of one to two months before the test. “Glycohemoglobin” is made when hemoglobin (Hb), which is found in red blood cells and carries oxygen around the body, attaches itself to glucose. Hemoglobin A1c is one of these types of glycohemoglobin, and the higher the average daily blood sugar level, the more it increases. Since hemoglobin A1c is attached to red blood cells until the end of their lifespan (about 120 days), the percentage of hemoglobin A1c can be used to determine the status of blood sugar levels over the past one to two months. Furthermore, these levels do not fluctuate due to diet and exercise like blood sugar levels do.

It is also one of the diagnostic criteria for diabetes because it can help evaluate daily blood glucose status.

Renal and Urinary Metabolism

Blood Urea Nitrogen (BUN)

Urea nitrogen, the so-called “burnt residue of proteins,” is filtered out by the kidneys and discharged into the urine. If kidney function deteriorates, an unfiltered amount of blood remains in the bloodstream, causing the urea nitrogen level to rise.

Creatinine (Cre)

Creatinine is a waste product formed from substances in muscles; it is filtered out by the kidneys and discharged in the urine. The amount of creatinine is said to be related to muscle mass and the amount of exercise someone does. Due to this, creatinine levels are generally higher in men than in women. As muscle mass decreases, so do creatine levels. Pregnancy also results in lower levels because more creatinine is excreted through urine.

The level of creatinine in the blood is an indicator of renal (kidney) function. If renal function is impaired, the excretion rate decreases and the level of creatinine in the blood increases.

Uric Acid (UA)

Uric acid is a waste product that comes from the breakdown of purines, a substance produced when cells break down and energy metabolism occurs.

It is known as the causative agent of gout, but it can also cause ureteral stones and kidney damage. A high uric acid level also indicates that the body is susceptible to arteriosclerosis.