Medical Examination Program

Kyungpook National University Medical Center
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Medical Examination Program

Kyungpook National University Medical Center
## Basic medical examination program

Composed of around 100 basic tests, the basic medical examination program is aimed at early diagnosis of malignant tumors and other common diseases.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interview and preliminary exam</td>
<td>Height, weight, blood pressure, pulse rate, body mass index (BMI), body fat percentage (BFP), body water content, muscle mass measurements</td>
</tr>
<tr>
<td>Ophthalmic examination</td>
<td>Digestive system screening: Gastroscopy under conscious sedation. This gastroscopy is performed by using conscious sedation and, therefore, easier for patients than conventional gastroscopy. H. pylori test: Test of helicobacter pylori that can cause chronic gastritis, gastroduodenal ulcers, gastric cancer, lymphoma, etc. Colonoscopy: Endoscopy for the lower gastro-intestinal tract including terminal ileum, cecum, colon, and rectum. H.pylori test: Test of helicobacter pylori that can cause chronic gastritis, gastroduodenal ulcers, gastric cancer, lymphoma, etc. Colonoscopy: Endoscopy for the lower gastro-intestinal tract including terminal ileum, cecum, colon, and rectum.</td>
</tr>
<tr>
<td>Gynecological examination</td>
<td>Carotid ultrasound: Screening for stenosis of carotid artery based on carotid blood flow. Breast ultrasound: Screening for breast cancer, breast mass, fibroadenoma, cyst, etc. Thyroid ultrasound: Screening for thyroid cancer, thyroid mass, cyst, etc. Pelvic ultrasound: Screening for female diseases of the ovary and uterine tumors and cysts. Prostate ultrasound: Screening of prostate cancer. Echocardiography: Screening for cardiac diseases based on the movements and blood flow of heart. Cervicography: Screening for cervical cancer by image of cervix taken by a special camera and examined by a specialist. HPV: Screening for HPV infection, which is the cause of cervical cancer. Cervical cancer vaccination (three times): Prevention of diseases caused by HPV and precancerous or dysplastic lesions.</td>
</tr>
</tbody>
</table>

※ Fees: 400,000 KRW for men, 450,000 KRW for women

## Optional examinations

Before beginning your examination, you can select optional tests and add your choice to the basic program after consulting with the nurse.

<table>
<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td>Tumor inspection (PET-CT)</td>
<td>As the name suggests, PET-CT (Positron emission tomography-computed tomography) combined benefits of biochemical information and anatomical images, enabling early diagnosis of cancer, determination of metastasis, and accurate location of cancer cells.</td>
</tr>
<tr>
<td>MRI Brain MRI + MRA</td>
<td>Screening for accurate diagnosis by precise observation within the cranium for brain tumor, cerebral infarction, cerebrovascular stenosis, etc.</td>
</tr>
<tr>
<td>CT Low-dose lung CT</td>
<td>Screening for early diagnosis of lung cancer or other lung diseases.</td>
</tr>
<tr>
<td>Abdominopelvis CT</td>
<td>Screening for abdominal digestive organs like liver, pancreas, spleen, and gall bladder, and pelvic organs like bladder, uterus, and ovaries.</td>
</tr>
<tr>
<td>Gastroscopy under conscious sedation:</td>
<td>This gastroscopy is performed by using conscious sedation and, therefore, easier for patients than conventional gastroscopy. H. pylori test: Test of helicobacter pylori that can cause chronic gastritis, gastroduodenal ulcers, gastric cancer, lymphoma, etc. Colonoscopy: Endoscopy for the lower gastro-intestinal tract including terminal ileum, cecum, colon, and rectum.</td>
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<td>Carotid ultrasound</td>
<td>Screening for stenosis of carotid artery based on carotid blood flow.</td>
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<tr>
<td>Breast ultrasound</td>
<td>Screening for breast cancer, breast mass, fibroadenoma, cyst, etc.</td>
</tr>
<tr>
<td>Thyroid ultrasound</td>
<td>Screening for thyroid cancer, thyroid mass, cyst, etc.</td>
</tr>
<tr>
<td>Pelvic ultrasound</td>
<td>Screening for female diseases of the ovary and uterine tumors and cysts.</td>
</tr>
<tr>
<td>Prostate ultrasound</td>
<td>Screening of prostate cancer.</td>
</tr>
<tr>
<td>Echocardiography</td>
<td>Screening for cardiac diseases based on the movements and blood flow of heart.</td>
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<tr>
<td>Cervicography</td>
<td>Screening for cervical cancer by image of cervix taken by a special camera and examined by a specialist.</td>
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<td>Prevention of diseases caused by HPV and precancerous or dysplastic lesions.</td>
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Additional charges apply for stomach and bowel biopsy, and the examination is performed in one day.

### Couple’s examination program

This examination program is designed for couples to take together.

<table>
<thead>
<tr>
<th>Program</th>
<th>Examination items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couple’s examination (for men)</td>
<td>Basic medical examination + detailed cerebrovascular examination for men + low-dose lung CT and colonoscopy</td>
</tr>
<tr>
<td>Couple’s examination (for women)</td>
<td>Basic medical examination + detailed cerebrovascular examination for women, low-dose lung CT and colonoscopy</td>
</tr>
</tbody>
</table>

### VIP examination program

The VIP medical examination program offers the most precise examination whilst enjoying luxurious accommodation.

<table>
<thead>
<tr>
<th>Program</th>
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</thead>
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<tr>
<td>VIP examination (2 days)</td>
<td>Men</td>
</tr>
<tr>
<td></td>
<td>Basic medical examination + cerebrovascular/ heart men’s detailed examination, colonoscopy, body PET-CT, conscious sedation and biopsy fees included, H.pylori test, thyroid ultrasound, consultation</td>
</tr>
<tr>
<td></td>
<td>Women</td>
</tr>
<tr>
<td></td>
<td>Basic medical examination + cerebrovascular/ heart women’s detailed examination, colonoscopy, body PET-CT, conscious sedation and biopsy fees included, H.pylori test, thyroid ultrasound, consultation</td>
</tr>
<tr>
<td>VIP examination (3 days)</td>
<td>Men</td>
</tr>
<tr>
<td></td>
<td>Basic medical examination + cerebrovascular/ heart men’s detailed examination, colonoscopy, body PET-CT, low-dose lung CT, spine MRI (select 1 of cervical, thoracic or lumbar MRI), thyroid ultrasound, conscious sedation and biopsy fees included, H.pylori test, consultation</td>
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<td>Women</td>
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<td>Basic medical examination + cerebrovascular/ heart women’s detailed examination, colonoscopy, body PET-CT, low-dose lung CT, spine MRI (select 1 of cervical, thoracic or lumbar MRI), thyroid ultrasound, conscious sedation and biopsy fees included, H.pylori test, consultation</td>
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* Additional charges apply for stomach and bowel biopsy, and the examination is performed in one day.*

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**Item Description**

For women:
- Pelvic ultrasound, breast ultrasound, thyroid ultrasound, hormone tests, colposcopy, HPV
- Ultrasound prostate, testosterone test, Bone Mineral Density (BMD) test
- 2D-UCG, Myocardial perfusion (MIBI) scan

For men:
- Brain MRI + MRA, carotid artery ultrasound

For men:
- Basic medical examination + cerebrovascular examination, colonoscopy, body PET-CT, thyroid ultrasound, consultation
- H.pylori test, consultation

For women:
- Basic medical examination + cerebrovascular examination, colonoscopy, body PET-CT, thyroid ultrasound, consultation
- H.pylori test, consultation

For men:
- Basic medical examination + cerebrovascular examination, colonoscopy, body PET-CT, low-dose lung CT, spine MRI (select 1 of cervical, thoracic or lumbar MRI), thyroid ultrasound, conscious sedation and biopsy fees included, H.pylori test, consultation

For women:
- Basic medical examination + cerebrovascular examination, colonoscopy, body PET-CT, low-dose lung CT, spine MRI (select 1 of cervical, thoracic or lumbar MRI), thyroid ultrasound, conscious sedation and biopsy fees included, H.pylori test, consultation

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**VIP examination program**

The VIP medical examination program offers the most precise examination whilst enjoying luxurious accommodation.
Medical Examination Center

Lifelong health management begins with prevention through early diagnosis.

- Inquiry / reservation: Call 053)200-3000, 3100

▶ One-stop service
  • Reduced examination time due to an integrated medical data system
  • One-stop service for secondary close examination and optimal treatment, from ambulatory care reservation to admission, examination, and surgery all on the same day

▶ State-of-the-art medical equipment and excellent staff
  • Accurate examination through state-of-the-art medical equipment
  • Reliable medical consultation with specialists from different fields

▶ Specialized medical examination programs
  • Diverse and precise cancer screenings for early prevention and diagnosis
  • Brain and Alzheimer’s test for prevention and diagnosis of aging and geriatric diseases

▶ Medical examination with VIP accommodation
  • Examinations with luxurious and comfortable accommodation
  • A one-to-one, customized health examination by dedicated doctors and coordinators

▶ Lifelong customer management
  • Regular follow-ups according to abnormalities found in the examination results
  • Continuous management and consultation with coordinators to help customers maintain lifelong health

NHIS Medical Examination Program

Consultation and reception
- Call: 053) 200-3000, 3100
- Hours: Mon-Fri, 8am – 5pm
- Private consultation with nurse 2-3 days before checkup
- SMS reminder sent 1 day before checkup

Reception and payment
- Register and pay at the Medical Examination Center Health Promotion Center, 1st floor of the Cancer Center
- Submit pre-examination materials, questionnaire and stool samples

Basic checkup
- Checkup begins: Mon-Fri, 08:00-08:30
- Duration of examination: 2.5 hours – 4 hours

Overall diagnosis and consultation
- Consultation of the results will take place 10-14 days after checkup
- If abnormalities are found after the checkup, patients can be directly referred to ambulatory care
PET-CT is used for various purposes including diagnosis of various cancers and special diseases like senile dementia, and detection of recoverable area in myocardial infarction. Conventional x-ray imaging, ultrasonography, CT, and MRI record anatomical images of cancer cells and tumors inside the body. Due to limited resolution, these technologies often fail to detect small cancer cells or tumors of less than 1cm. Also, when detected, it is difficult to distinguish whether they are benign or malignant. However, by using PET-CT, we can discover very small cancer cells or tumors of only a few millimeters in size, as well as check for cancer metastasis, relapse and the effects of anticancer medicine. Additionally, this technology enables tracking of the source area of the cancer or tumor.

**PET-CT Features**

- Enables detection of cancer in any area of the body through one screening
  - Without complicated and onerous examinations such as CT, MRI, ultrasonography, and biopsy, this state-of-the-art device creates image of the entire body and helps find very small cancers.
- Can diagnose and locate cancer
  - PET-CT has very high clinical value because it helps diagnose and locate cancer and, thereby, determine the most effective treatment method.
- Used for diagnosing other diseases
  - In recent years, PET-CT has been used widely for diagnosing brain diseases, early diagnosis of dementia, and brain lesions of epileptics, as well as evaluating viable myocardium in myocardial infarction.
- Short examination time
  - It takes 20~25 minutes from drug injection to entire body imaging. A PET-CT examination can be over in 30 minutes.

**PET-CT Advantages**

- Reservation is required for PET-CT as the test requires radiopharmaceuticals. Additionally, for cancellation or change of reservation, please notify the center at least one day prior to the reserved date.
- Please keep your reservation time as the test requires injection of radiopharmaceuticals and a designated time frame.
- Intake of any food, cigarette smoking, and coffee are forbidden six hours before the examination. However, please drink plenty of water and no beverage containing sugar. If you have a morning appointment, do not take breakfast; if your appointment is in the afternoon, you may take a light meal before 7am but must fast until your examination time.
- If you have diabetes, you are required to take a preliminary test and consult your doctor. If you received a radiographic examination using contrast media (gastro-intestinal series, CT, etc.), you must wait for a few days before receiving PET-CT.
- Metals must be removed from the body before the test.
- Pregnant women or women who may be pregnant cannot receive the examination.
**What is a stroke?**

Stroke is a neurological symptom caused by obstruction of blood flow to the brain that results in partial brain damage. Strokes can be largely divided into two types: the first is called ischemic stroke that results in damage to the part of brain that received blood supply through blood vessel. The second type of stroke is cerebral hemorrhage (hemorrhagic stroke), which is caused when an artery in the brain bursts and it results in localized bleeding in the area of the brain that is damaged.

**Causes of stroke**

- Atherosclerotic thrombosis: linked to hypertension, diabetes, hyperlipidemia, etc.
- Embolism: linked to cardiac arrhythmias, heart failure, myocardial infarction, etc.
- Hypertensive intracerebral hemorrhage
- Aneurysms
- Vascular malformation
- Blood diseases
- Moyamoya disease

**Symptoms of stroke**

- Unilateral paralysis
- Paresthesia and sensory loss
- Dizziness
- Phonological disorder (dysarthria): unclear articulation of speech
- Language disorder (aphasia): sudden loss of linguistic abilities
- Ataxia: loss of control of hand and foot movement without paralysis
- Field of vision, visual disturbance: sudden loss of eyesight in one eye or darkened corner of vision
- Diplopia: double vision
- Dysphagia
- Consciousness disorders
- Dementia

**Diagnosis of stroke**

- **Symptoms and neurological test**

- **Brain CT**

  A CT scan is one of the most common methods for stroke diagnosis and uses x-ray. It can be used for rapid diagnosis of stroke, early diagnosis of brain tumor, diagnosis of progressive inflammatory disease, and skull fracture caused by severe trauma. However, CT scans can cause difficulty with diagnosis as a brain tumor can appear to be a stroke, and, in case of ischemic stroke, the lesions are visible only after some time.

- **Brain MRI & MRA**

  Along with CT scans, MRI is one of the most commonly used methods for stroke diagnosis, and enables observation inside the body by using magnetic field. Compared to CT scans, it renders much clearer images, and does not require exposure to x-ray. Also, it is much more useful than a CT scan when diagnosing early ischemic stroke, infarction of a small area, and brain tumor that appears similar to a stroke. Largely, it can be divided into MRI and MRA. The MRA checks the thinness of the brain and the state of brain parenchyma while the MRA checks the blood vessels. When cerebrovascular diseases are suspected, it is common to perform both MRI and MRA.

- **Carotid ultrasonography**

  Carotid ultrasonography uses ultrasonic-wave, a non-invasive method, to check carotid vessels. By measuring the thickness of carotid intima-media, it is possible to check whether blood clots were formed in the blood vessel and the narrowness of the blood vessel. Also, blood flow speed in carotid can be examined by using Doppler sonography.
Heart scan

What is myocardial infarction?

Heart functions by supply of oxygen and nutrition largely through three coronary arteries. When one of the three arteries is suddenly blocked due to thrombosis or fast vasoconstriction, the supply of oxygen and nutrition to the entire or a part of the heart decreases rapidly, and results in tissue or cell death in the heart muscle (necrosis).

Risk factors

- Correctable risk factors
  - Hyperlipidemia, hypertension, diabetes, smoking, obesity, stress, lack of exercise, alcohol consumption, etc.
- Uncorrectable risk factors
  - Age: Men ≥ 45, Women ≥ 55
  - Gender: Male > Female
  - Family history of heart disease: If a parent or sibling had ischemic heart disease before 55 years of age (a male family member) or 65 (female)

Symptoms

In most cases, patients complain of sudden chest pain.

- General symptoms
  - ‘Squeezing’ or ‘sweeping’ pain in the middle or slight left of the chest
  - Pain in the pit of the stomach or end of the chin
  - Often accompanied by difficulty of breathing
  - Sometimes the pain spreads to the inside of the left arm
  - The chest pain generally lasts for more than 30 minutes
  - The symptom is not eased even after administering nitroglycerin sublingual tablet

- Atypical symptoms
  - Nausea, vomiting without chest pain
  - Complaint of indigestion or heart burn
  - Sudden dizziness

Diagnosis

- Symptom: Chest pain
  Myocardial infarction can be generally diagnosed by the typical chest pain, and, if such symptom is detected, visit an emergency room nearby as quickly as possible.
- Electrocardiogram (ECG)
  Electrocardiogram creates a drawing of electric current of the heart based on electrodes attached on the skin, and various data related to myocardial infarction and arrythmia.
- Echocardiography
  The quickest and most efficient test method, it uses ultrasonic waves to evaluate the heart shape, the thickness of the ventricular, atrial and ventricular size, the size of the aortic, valve structure and function, and ventricular contractility. It helps diagnosis of acute myocardial infarction, valvular heart disease, myocarditis, hypertrophic / dilated cardiomyopathy, congenital heart disease, infective endocarditis and aortic dissection.
- MIBI SPECT
  This uses radio isotope and records images of its distribution to diagnose blood circulation of heart muscle. It is used for various purposes for diagnosing coronary artery disease, prognosis, risk assessment, and diagnosis of myocardial infarction, viability of the heart muscle, and evaluation of PCI (percutaneous coronary intervention) and CABG (coronary artery bypass grafting) results.
Features of the tumor marker test

Radiography, ultrasonography, blood tests and histopathology can be used to diagnose cancer. The tumor marker test uses blood for convenience and facility of management for screening tests of various cancers. The main purpose of tumor marker tests is early diagnosis of malignant tumor and, if the tumor has been already detected and being treated, the test is used for prognosis or relapse evaluation.

### CEA (carcinoembryonic Antigen)
- A test specific to colorectal cancer, as well as a broad spectrum tumor marker that increases in various other tumors including pancreatic cancer (60-90%), gastric cancer (40-60%), lung cancer (60% to 75%), and breast cancer (20-50%)
- Commonly increases in benign diseases such as liver cirrhosis (45%), emphysema (30%), rectal polyp (5%), benign breast disease (15%) and ulcerative colitis (15%)
- In case of colorectal cancer, it is used for determining the tumor size and clinical stage, prognosis, and post-surgery observation

### PSA (Prostatic specific antigen)
- Glycoprotein produced on the prostate epithelial cells and useful for early diagnosis, clinical stage determination, and observation of prostate cancer
- Increases in benign diseases such as prostatic hyperplasia, prostatitis, and prostatic infarct
- Prostate cancer is the most common type of cancer among Caucasian males and the prevalence is higher among older males. However, when diagnosed early while the cancer cells are contained within the prostate, it is treatable.

### CA-125
- Shows a high positivity of 70 to 100% in ovarian cancer, and 30% in endometrical cancer, and 30 to 50% in lung, pancreatic, and bile duct cancer.
- Can show false positivity during pregnancy and menstruation in women, and also can increase due to liver diseases and cirrhosis

### AFP (a-Fetoprotein)
- Suitable for screening of tumor markers for hepatoma and germ cell carcinoma
- Increases in benign diseases such as hepatitis and cirrhosis as well
- Useful for prognosis, treatment result, and clinical state determination of hepatoma
- Useful for screening birth defects of fetus during pregnancy

### CA 19-9
- A tumor marker tested positive in pancreatic cancer (84%), gastric cancer (35%), liver cancer (22%), gallbladder cancer (69%), and useful for early diagnosis of pancreatic cancer and bile duct cancer, and supplementary diagnosis of cancer in the body and tail of pancreatic cancer.
- The positivity in pancreatic cancer can be increased by accompanying CEA.

### Tumor marker test

http://eng.knumc.org
What is colorectal cancer?

Colorectal cancer refers to malignant tumor found in colon or rectum, and its prevalence and relevant death rate is rapidly increasing in South Korea due to westernized diet.

Symptoms

In most cases, symptoms do not appear during the early stage

- Rectal cancer
  - Anal bleeding, discomfort after bowel movement
  - Pain during bowel movement
  - Tenesmus

- Right-side colon cancer
  - Anemia, abdominal mass
  - Abdominal pain, fatigue, weakness

- Left-side colon cancer
  - Abdominal pain
  - Thinner stool than usual
  - Blood or mucus found during bowel movement

Causes

Like other types of cancer, the causes of colorectal cancer are not clear. However, a few factors have been identified as being related to it. It is generally believed that environmental factors are more significant than genetic factors in causing colorectal cancer. Rapid westernization of diet, especially excessive consumption of animal fat and protein, has been identified as one of the causes. However, around 5% of colorectal cancer is known to be caused by genetic factors.

Risk factors

- Diet
  - Animal fat, meat, saturated fat
  - Low-fiber diet, processed, low-residual diet
  - Alcohol

- Genetics
  - Familial polyposis and non-polyposis colorectal cancer increase the risk of colorectal cancer

- Related diseases
  - Adenomatous polyps: malignant tumor that can develop into colorectal cancer
  - Inflammatory bowel disease: ulcerative colitis, Crohn's disease

- Other risk factors
  - Level of physical activity: Physical activity and exercise reduces the risk of colorectal cancer
  - Age over 50

Early diagnosis of colorectal cancer

Diagnosis of colorectal cancer can be confirmed only when cancer tissue is detected in biopsy using colonoscopy. In most cases, colorectal cancer does not accompany symptoms during the early stage, and, therefore, it is recommended that everyone who is 50 and older receive colon test. Tests that are helpful for colorectal cancer diagnosis include rectal examination, stool examination, colonography, CT or MRI scans, ultrasound examination, and blood tests.
**Colorectal cancer screening**

**Colonoscopy**

For colonoscopy, the endoscope is sent through the anus to observe the entire colon and, colonoscopy enables most accurate diagnosis of bowel diseases. Patients are required to have light dinner, such as soup, the day before the examination, and take an evacuant to remove excreta from the colon. Colonoscopy boasts a very high diagnosis rate of colorectal cancer and polyps and enables biopsy and polyps removal. However, it can cause pain during the examination and, when sleep inducer is used to reduce pain, it can cause side effects. Also, albeit rarely, complications like perforation may be caused due to the procedure and the examination cannot be completed if the colon is blocked.

- Colonic Diverticulosis
- Crohn’s disease
- Colon polyp
- Advanced colorectal cancer

**CEA (Carcinoembryonic Antigen)**

- A test specific to colorectal cancer, as well as a broad spectrum tumor marker that increases in various other tumors including pancreatic cancer (60-90%), gastric cancer (40-60%), lung cancer (60% to 75%), and breast cancer (20-50%)
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**Stomach cancer screening**

**What is stomach cancer?**

Stomach cancer mostly refers to gastric adenocarcinoma that is found in the mucosa of stomach, and is divided into early and advanced gastric cancer. It is the most prevalent type of cancer.

**Causes**

Stomach cancer is caused by interaction of various genetic and environmental factors, and the pathogenesis has not been clearly identified yet.

**Risk factors**

- Related disease
  - History of gastric surgery, chronic atrophic gastritis, pernicious anemia, Helicobacter pylori infection, polypoid polyps
- Diet
  - Preservatives, salty food, low-fiber diet
- Genetics
  - The risk increases by four times when there is family history
- Other risk factors
  - Stomach cancer is as twice more common among men as women, and most commonly found among people in their 50s and 60s
  - Drinking, smoking
Symptoms

In most cases, there are no symptoms during the early stages

- Related diseases
  - No symptoms (mostly no symptom appears during the early stage)
  - Heartburn

- Related symptoms
  - Weight loss
  - Abdominal pain
  - Nausea, vomiting
  - Loss of appetite
  - Difficulty swallowing
  - Gastrointestinal bleeding

Early diagnosis

Gastroscopy and UGI is used for diagnosis of stomach cancer

Gastroscopy

For gastroscopy, an endoscope is sent past throat and larynx via esophagus and stomach until the center of the duodenum, and enables most accurate diagnosis of various diseases found in stomach, esophagus, and duodenum like esophagitis, esophageal cancer, gastritis, gastric ulcer, gastric and duodenal ulcers.

In recent years, the technological development has reduced the thickness while increasing resolution of endoscopes and patients can now enjoy easier examination and early diagnosis of early stage gastric cancer or esophageal cancer that is a few millimeters in size.

UGI (upper gastrointestinal)

With UGI, patients swallow liquid contrast media and changes positions to examine how the media is covered on the stomach walls and diagnose lesions. Although it is less uncomfortable than gastroscopy, it is less effective than gastroscopy in detecting early lesions and, if abnormal lesion is found and biopsy is required, gastroscopy must be performed again.

What is Helicobacter Pylori?

Helicobacter Pylori is a type of bacteria that lives in the stomach and can cause chronic gastritis, gastroduodenal ulcers, gastric cancer and lymphoma. Although about 60% of adults in South Korea are infected with this bacteria, presence of the bacteria does not necessarily cause gastric cancer or ulcer.
Liver cancer screening

What is liver cancer?
Liver cancer is a malignant tumor found in liver and is the 4th most common type of cancer.

Risk factors
- Hepatitis B and C: Hepatitis B and C accounts for 70% and 10%, respectively, of the entire liver cancer cases in South Korea.
- Alcoholic hepatitis: Accounts for 10% of the liver cancer in South Korea.
- Other risk factors:
  - Cirrhosis
  - Aflatoxin B1 (carcinogen): found in aspergillus, fungus in old peanuts, etc.

Symptoms
In most cases, there are no symptoms during the early stages.
- General symptoms:
  - Upper abdominal pain, systemic weakness, loss of appetite, nausea, weight loss
- Advanced symptoms:
  - Upper abdominal mass (lump), severe pain, abdominal dropsy, distension, jaundice (skin and eyes), hepatic encephalopathy, hematemesis, bloody vomit and stool

Early diagnosis
Abdominal ultrasonography obtains real-time images in various planes and is safe for it does not use radiation. It is most commonly used for liver cancer screening as there is no preparation required.

Ultrasonography
This protein increases in the serum of those with liver cancer, and although it can be easily measured by blood test, it is not highly accurate. Therefore, other diagnosis method must be accompanied.

AFP: \(\alpha\)-fetoprotein
- A tumor marker tested positive in pancreatic cancer (84%), gastric cancer (35%), liver cancer (22%), gallbladder cancer (69%), and useful for early diagnosis of pancreatic cancer and bile duct cancer, and supplementary diagnosis of cancer in the body and tail of pancreatic cancer.
- The positivity in pancreatic cancer can be increased by accompanying CEA.

Tests for risk factors of liver cancer
- Hepatitis B and C test: HBS AB/ Anti HCV Ab
  - A test for infection of hepatitis virus that causes hepatitis, cirrhosis, and liver cancer. If the test result of hepatitis B surface antigen (S antigen) is positive, it means the person is a hepatitis carrier and must receive close examination. Hepatitis C antibody does not have immunity and, if the test result is positive, close examination is required.
- Other techniques for close examination and diagnosis of liver cancer
  - CT and MRI: CT and MRI costs more than ultrasonography. They require repetitive tests, but ensure a more accurate diagnosis.
What is lung cancer?

Lung cancer is the most common cancer in the world and, especially, a major cause of death among men. Early diagnosis is rare and, due to lack of suitable treatment, it has the highest death rate among all types of cancers.

Causes

- Smoking: including secondhand smoking, the most serious risk factor
- Environmental carcinogen: pollution, etc.
- Exposure to radiation
- History of lung disease
- Genetic factors

Symptoms

In most cases, no symptoms are found in the early stage, and early diagnosis is difficult because atypical symptoms are often presented.

- Coughing: 75% of lung cancer patients complain frequent coughing
- Sputum, bloody sputum: If blood is found in sputum or cough, consult a specialist immediately
- Difficulty with breathing
- Hoarseness
- Chest pain
- Repeated pneumonia and bronchitis
- Other: weight loss, nausea, vomit, upper limb edema

Early diagnosis

Diagnosis is performed by using chest radiograph, sputum cytoscopy, bronchoscope, chest CT and percutaneous needle aspiration

Low-dose chest CT

Low-dose chest CT scan enables precise test result with only 1/6 of the radiation used in conventional CT scan, and is actively used worldwide for lung cancer diagnosis. This technology is highly useful for diagnosing early lung cancer as the chest x-ray imaging can detect only 1-2cm or larger cancers, while low-dose chest CT scan can detect cancers as small as 3 to 4mm in size.

NSE, CEA (lung cancer marker test)

NSE, CEA are a type of enzyme present in neural tissue and the concentration in blood increases by neuroblastoma or small cell carcinoma of lung, and, therefore, is used for diagnosis and observation of the diseases. However, a high level of tumor marker does not always mean malignant tumor, and this blood test is used when lung cancer is suspected or to follow up treatment result.

Lung function test

Vital capacity test is the most convenient and common method testing lung functions, and measures the amount of air airflow as the subject inhales and exhales during a given time. Vital capacity test result shows significant correlation with disease morbidity and survival, and can determine lung disease, seriousness of a disease, and response to treatment.
Prostate cancer screening

What is prostate?
Prostate is a sex accessory gland found only in males, and produces and stores a large part of liquid carried by sperm. Its function is influenced by male hormones including testosterone. Most testosterone is produced in testicles but a small portion of it is produced in adrenals.

What is prostate cancer?
Prostate is unique to males and one of male reproductive organs that produces part of sperm. It is located right below the bladder and in front of rectum, covering urethra from the bladder. Prostate cancer is a malignant tumor caused by abnormal division of prostate cells.

Causes
The causes of prostate cancer have not been clearly identified, but presumed to be related to genetic factors, male hormones, diet, increased fat consumption, sex life, and socioeconomic state.

Symptoms
Although there is no symptom in the early stage, after it progresses, symptoms are presented.
• General symptoms
  - Urine disorder, residual urine, acute urinary retention, bloody sperm and urine
• Advanced symptoms
  - Hydronephrosis due to urinary retention, renal failure, bone metastasis and other bone pain, back pain due to spinal metastasis

What is benign prostatic hyperplasia?
Most men experience increase of prostate after 50, and this is called benign prostatic hyperplasia. This is neither malignant nor related to prostate cancer. Slight benign prostatic hyperplasia is a natural aging process, although the cause is not known.
### Self-diagnosis of benign prostatic hyperplasia

Combine the numbers on the scale of each question for assessment.

| Question                                                                 | Score | Scale                        | Amount | Time | Amount | Time | Amount | Time | Amount | Time | Amount | Time | Amount | Time | Amount | Time | Amount | Time | Amount | Time | Amount | Time | Amount | Time | Amount | Time | Amount | Time | Amount | Time |
|--------------------------------------------------------------------------|-------|------------------------------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|
| 1. In the past month, how often have you had a sensation of not emptying your bladder completely after urinating? | 0     | Not at all                   | 1      | Once out of 5 times | 2      | Less than ½ the time | 3      | About ½ the time | 4      | More than ½ the time | 5      | Almost always |
| 2. In the past month, how often have you had to urinate again less than two hours after you have urinated? | 0     | Not at all                   | 1      | Once out of 5 times | 2      | Less than ½ the time | 3      | About ½ the time | 4      | More than ½ the time | 5      | Almost always |
| 3. In the past month, how often have you stopped and started, several times when you urinated? | 0     | Not at all                   | 1      | Once out of 5 times | 2      | Less than ½ the time | 3      | About ½ the time | 4      | More than ½ the time | 5      | Almost always |
| 4. In the past month, how often have you found it difficult to postpone urination? | 0     | Not at all                   | 1      | Once out of 5 times | 2      | Less than ½ the time | 3      | About ½ the time | 4      | More than ½ the time | 5      | Almost always |
| 5. In the past month, how often have you had a weak urinary stream? | 0     | Not at all                   | 1      | Once out of 5 times | 2      | Less than ½ the time | 3      | About ½ the time | 4      | More than ½ the time | 5      | Almost always |
| 6. In the past month, how often have you had to push or strain to urinate? | 0     | Not at all                   | 1      | 1 times | 2      | 2 times | 3      | 3 times | 4      | 4 times | 5      | More than 5 times |
| 7. In the past month, how often have you had to wake to urinate from the time you went to bed until the time you got up in the morning? | 0     | Not at all                   | 1      | 1 times | 2      | 2 times | 3      | 3 times | 4      | 4 times | 5      | More than 5 times |

**Total Score**:
0: No symptom / 1–7: Mild / 8–24: Moderate (urological examination recommended) / 25 or higher: Severe (urological examination required)

### Early diagnosis

PSA, rectal inspection, prostate ultrasonography, and biopsy are helpful for early diagnosis.

**Prostate ultrasonography and biopsy**

In this special ultrasonography, a probe is inserted into the rectum to examine the prostate, and simultaneously, biopsy of the prostate. It is used for detecting prostate nodule, appearance and size, invasion of cancer into the prostate film, etc., as well as observing the size of prostate after treatment and other followup inspection. However, although it is useful for detecting a lesion for suspected prostate cancer, this alone cannot confirm cancer diagnosis. However, it can be a useful screening test for early diagnosis if PSA value is taken into account.

**Abdominopelvic CT scan**

This test is useful for diagnosing liver disease, biliary disease, kidney disease, gastrointestinal tract disease, pancreatic disease, and determining clinical stage of cancer.

**PSA test**

Prostate-specific antigen is the most important tumor marker for diagnosis of prostate cancer, and increases in case of prostatic cancer. The normal level is 4 or less, and cancer is suspected when the level is 10 or higher.

**Testosterone and sex-hormone-binding globulin test**

Testosterone, a male hormone produced in testicles, is known to be linked to growth and metastasis of prostate cancer. And, recently, it is known as a hormone related to male menopause, and 8 mmol/L (230 ngm/dL) or lower levels are diagnosed as male menopause.
What is thyroid cancer?

Thyroid nodule is one of the most common endocrine disorders and is more commonly found among females than males and among the elderly. It must be tested for benignity or malignity for 5 to 10% of it is cancer.

Early diagnosis of thyroid cancer

Thyroid function test

Thyroid function test is very important because dysfunctional thyroid causes abnormal secretion of thyroid hormones. As people age, it is common, especially among women, to find thyroid hormone disorder and patients often do not feel any symptoms. Therefore, the thyroid hormone test is included as the first test for most thyroid diseases.
Breast cancer screening

What is breast cancer?
Breast cancer is a malignant tumor found in breasts and is the most common type of cancer among South Korean women.

Risk factors
- Genetic factors
  - Family history of breast cancer
- Long-term hormonal stimulation
  - Early menarche, late menopause, long-term injection of female hormones after menopause
  - Women with no experience of childbirth; women who first gave birth after 30; women who did not breastfeed their children
- Related disease
  - Women who had breast cancer in one of the breasts; women who were diagnosed with productive breast disease by biopsy in the past
- Environmental factors
  - Obesity, excessive animal fat intake, alcohol, smoking

Symptoms
In most cases, no symptoms are found during the early stage
- Change in breasts
  - Lump in the breast or armpit
  - Sudden inversion of nipples
  - Secretion from the nipples (especially bloody secretion)
  - Sore nipples, repeated eczema, change in breast skin, ulcer of breast skin
  - Swollen breast with inflammatory symptom

Breast cancer diagnosis
Mammography
Mammography is one of the most essential screening test for breast diseases and most sensitive to early breast cancer without symptoms. However, it has limitations in diagnosing young women as they have a large quantity of fibers in breasts.

Breast ultrasonography
It is useful for examining young women with high density of breast tissues. Also, it is an essential screening test to confirm cancer diagnosis and biopsy of small mass. Between 60 and 80% of malignant and benign tumors can be distinguished in ultrasonography evaluation, and, if malignant tumor is found or suspected, biopsy is performed. If not, follow up test is performed after 6 months, 1 year, or 2 years.
What is cervical cancer?

Cervical cancer is a cancer found in the cervix, which is located on the border between the womb and vagina. It is the second most common type of cancer among women around the world, and about 500,000 cases are reported annually. It is important to detect and treat cervical cancer when there is no symptom.

Risk factors

• HPV infection
  - Through sexual intercourse
  - Among women who started sexual intercourse at early age
  - Among women who have had many sexual partners

• Other risk factors
  - Smoking, HIV infection, use of immunosuppressants

Symptoms

In most cases, no symptoms are presented during the early stage, and the most common symptom is vaginal bleeding.

• Abnormal vaginal bleeding
  - Bleeding after menopause; irregular bleeding outside the menstrual period
  - Bleeding after sexual intercourse or excessive exercise

• Advanced symptom
  - Increase of vaginal secretion, bad odor of vaginal secretion, pelvic pain, lower limb pain, weight loss

Early diagnosis

Pap test

Pap test is recognized as a standard method for early diagnosis of cervical cancer, and has the advantages of low costs and simple specimen collection. However, it has a high false negative rate, and, therefore, can fail to diagnose lesions. For the test, cells from the cervix is collected by using a spatula and cytobrush and smeared evenly on a slide, before immediately immersing the slide in 95% ethyl alcohol to fix it.

HPV test

Constant HPV infection is the most important factor in development of cervical cancer. When accompanied by pap test, HPV test shows over 95% sensitivity to cervical cancer.

Cervicography

Cervicography is a screening test that uses the same mechanism as colposcopy and a specialist interprets and evaluates the image of external orifice of uterus. As pap test has limitations when used alone, cervicography can improve accuracy in cervical cancer screening.
**Uterine, ovarian cancer screening**

**ThinPrep pap test**

This Pap smear test enables even more accurate diagnosis of cervical cancer, and the pap specimens are put in a container with special reagent. Compared to conventional tests, this test allows a large part of the collected cells to be used for diagnosis and also tested for STDs (sexually transmitted diseases) and gonorrhea.

**Pelvic ultrasonography (uterine/ovarian ultrasonography)**

This test is aimed at diagnosing diseases in uterus and ovary by using ultrasonic waves. As the body of the uterus, endometrium, ovary, and oviduct cannot be examined by using Pap test or cervicography, pelvic ultrasonography must be performed to diagnose cancer or cyst in uterus or ovary, such as uterine fibroids and endometriosis. Pelvic ultrasonography can be divided into pelvic ultrasound and vaginal ultrasound.

**CA-125 (tumor marker test)**

This tumor marker increases due to cervical cancer, endometrial cancer, and other gynecological diseases. Although there is no sufficient evidence for it to be used for screening test or diagnosis of ovarian cancer, it can be useful for determining clinical state, prognosis, relapse, and followup of ovarian cancer.

**BMD (Bone Mineral Density)**

**What is osteoporosis?**

It is a systemic skeletal disease characterized by reduced bone mass and abnormal fine structure, that weaken the bones and make them brittle.

![Normal bone](image1)

![Osteoporosis](image2)

**Risk factors**

- **Genetic factors**
  - History of fracture of the mother, small physique
- **Lifestyle and nutrition**
  - Smoking, excessive alcohol intake, inactivity, continuous decrease of activity, low weight
- **Disease**
  - Hyperthyroidism, diabetes, etc.
- **Medication**
  - Use of glucocorticoid, etc.

**Diagnosis**

**BMD**

BMD is a test that presents the severity of osteoporosis. The level is called T-score, with 0 being the normal level and higher numbers mean higher bone density and lower (negative) numbers mean lower bone density, hence, higher risk of osteoporosis.
Diagnosis criteria of osteoporosis

• Normal
  - Reduction of bone density within 1.0 standard deviation from that of normal adults (BMD > -1.0 SD)

• Bone deficiency
  - Reduction of bone density within 1.0 to 2.5 standard deviation from that of normal adults ( -1.0 SD > BMD > -2.5 SD)

• Osteoporosis
  - Reduction of bone density within 2.5 standard deviation from that of normal adults (BMD < -2.5 SD)

• Severe osteoporosis
  - Reduction of bone density within 2.5 standard deviation from that of normal adults and presence of fracture (BMD < -2.5 SD and fracture)
Follow normal routines and avoid excessive exercise or drinking.
Do not eat or drink anything (including water), chew gum or smoke after 10pm of the night before the examination (Brushing of teeth is allowed)
If you take medication for hypertension or heart disease, please use a small amount of water only. (However, if you have diabetes, please do not take the medicine in the morning of the examination date, and please inform your doctor during preliminary checkup).
Please carefully fill out the questionnaire and bring it with you on the day of examination.
For the stool test, please fill a small amount (size of a bean) into the container (about 1/3 of the container) and store it in dry and cool place before you bring it to the examination.
If you are pregnant or menstruating, please notify in advance for a later date.
If you need to change the reservation, we can schedule it for a later date.
Please keep the appointed time and avoid bringing valuable items.
Please avoid bringing a child if possible.
If you are coming by car, parking is available in the hospital car park. (Avoid driving or operating heavy machinery after receiving sedation endoscopy)
The result will be available between 10 days and two weeks after the examination.