Bed No.:
Name:
ID No.:
Date of birth:

Taichung Armed Forces General Hospital

冠狀動脈繞道手術說明書

Coronary Artery Bypass Grafting (CABG) Information

The Information provides details about the benefits, risks, and alternative options for the surgery you are about to undergo. It can serve as supplementary information for your discussion with your doctor. Please read it carefully. We hope you can fully understand what is described here. If you still have questions after your doctor has explained the surgery (or procedure) to you, please discuss your questions sufficiently with your doctor before you sign the form. Your doctor will be happy to answer your questions. Let's work together for your health.

Surgery (or procedure):

1. Anatomical diagram of coronary arteries: (Figures 1 and 2)

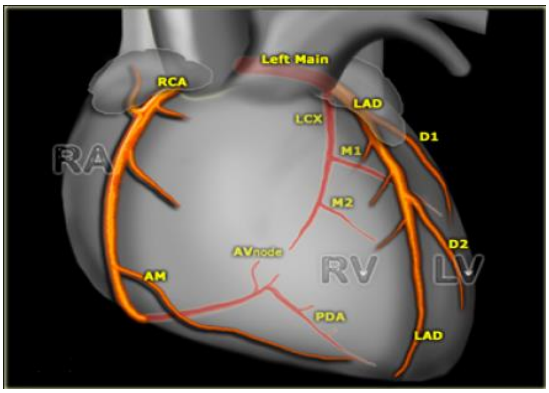

Figure 1. Front view of coronary arteries

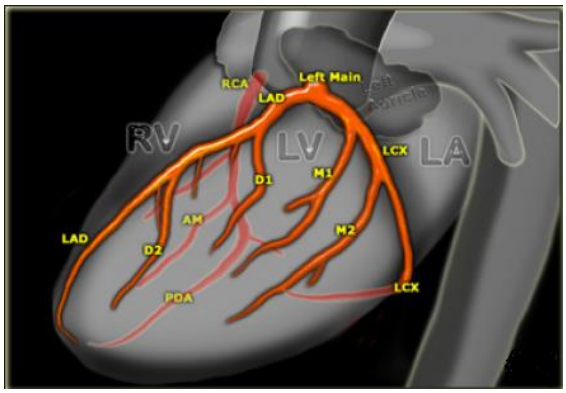

Figure 2. Lateral view of coronary arteries

2. Indications for CABG:

A. Left main coronary artery has a stenosis of more than 50%, with significant blockage (>70%) and stenosis of the proximal left anterior descending (LAD) and left circumflex arteries.

B. All three coronary arteries have lesions and the following conditions:
   1) Proximal LAD stenosis >75%
   2) Left ventricular dysfunction, with ejection fraction (LVEF) <50%
   3) Angina

C. Disease in two coronary arteries (one of which is the proximal LAD with stenosis >90%), with evidence of myocardial ischemia and angina.

D. Proximal LAD stenosis >90%, with evidence of angina or left ventricular dysfunction (LVEF <50%).

E. Cardiogenic shock or post-myocardial infarction complications such as ventricular rupture, mitral regurgitation, or left ventricular aneurysm.

F. Persistent or recurrent angina with hemodynamic instability (unstable vital signs) that cannot be controlled by medication and for which catheterization treatment is ineffective.

G. Failure of percutaneous coronary intervention (PCI), including symptoms like cardiac arrest,

ventricular tachycardia, ventricular fibrillation, cardiogenic shock, and angina.

3. Methods:

During the surgery, the internal thoracic artery, radial artery from the wrist, great saphenous vein from the leg, or the gastroepiploic artery is harvested with a traditional open-heart surgery approach to be used as the graft to complete the bypass surgery (as shown in Figures 3 and 4).

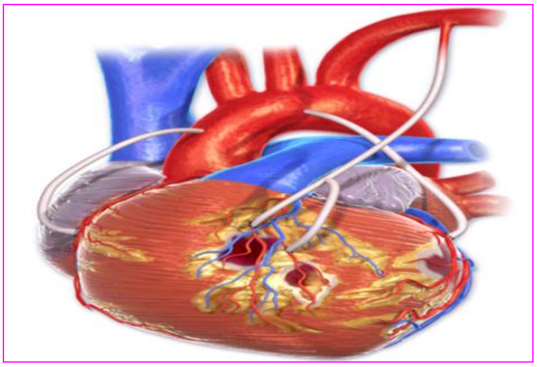

Figure 3. Diagram of CABG

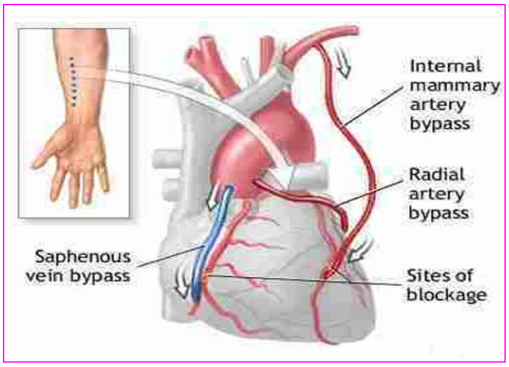

Figure 4. Diagram of CABG

Purpose or Benefits of the Surgery:

1. The following benefits may be gained through this surgery or procedure, but the doctor cannot guarantee that you will gain any of them; the decision between benefits and risks should be made by you.
2. The surgery aims to treat coronary artery stenosis, improve blood flow to the heart, and enhance heart function.
3. The primary goal of this surgery is to improve the quality of life and prevent heart failure.

Surgical risks (including post-surgery sequelae and complications):

1. No surgery or procedure is without any risk. Identified risks are listed below, but there are still potential unlisted risks that are not expected by the doctor.
2. CABG is a complex cardiac surgery associated with some degree of risk, and some patients may experience the following complications after surgery, as detailed below:
3. Post-surgery mortality and survival rates
   A. The mortality of CABG, as reported in domestic and international literature, is described below by patient condition:
      1) In general, the mortality ranges from 1.2% to 8.5%. It increases if the patient has risk factors.
      2) In patients who have had a previous myocardial infarction: The mortality ranges from 5% to 10.5%.
      3) In patients who have had percutaneous coronary balloon angioplasty: The mortality ranges from 2.5% to 11.3%.
      4) In those with acute myocardial infarction complicated by ventricular septal rupture: Mortality ranges from 10% to 60% depending on the severity of the condition, and is as high as 30%-100% in the cases of shock.
      5) In those with acute myocardial infarction complicated by mitral valve regurgitation: The mortality ranges from 16% to 46%. 3.1.1.6 With delayed aortic rupture or new onset of dissection, the mortality is increased to 20-30%
      6) In those with acute myocardial infarction complicated by ventricular rupture: Mortality ranges

from 10% to 34%, and if shock occurs, is as high as 30%-100%

7) If there is a left ventricular aneurysm, the mortality ranges from 3% to 30%, depending on the aneurysm size.
8) In those with acute myocardial infarction complicated by shock: The mortality ranges from 34% to 100%.
9) In patients over 70 years old: The mortality ranges from 7% to 24%.
10) If mitral valve replacement is performed concurrently: The mortality ranges from 12% to 22%.
11) If aortic valve replacement is performed concurrently: The mortality ranges from 8% to 21%.
12) In patients on hemodialysis (renal dialysis): The mortality ranges from 3% to 20%.

B. Causes of death:

1) Heart failure: 40%. 2) Sudden death or arrhythmias: 14%.
3) Cerebrovascular events (i.e., stroke) or hypoxic brain injury: 10%.
4) Respiratory failure: 3% (e.g. lung collapse, pneumonia, inability to remove the ventilator, or the need for a tracheostomy).
5) Bleeding: 2%. 6) Pulmonary embolism: 2%.
7) Liver failure: 1%. 8) Sepsis: 1%.
9) Abdominal emergencies (such as gastrointestinal ischemia, bleeding, ulcers, cholecystitis, pancreatitis, or bowel obstruction): 1%.
10) Kidney failure: 0.6% (depending on preoperative renal function. With preoperative renal dysfunction, the risk of kidney failure requiring hemodialysis will be increased).
11) Others: 1%. 12) Unknown causes: 2%.
13) Other causes unrelated to the surgery: 20%.

C. Survival: Survival varies depending on risk factors such as the location of stenosis, the number of blocked vessels, whether there is disease in the left main coronary artery, left ventricular function, status post myocardial infarction, age, and past medical history, as detailed in the table below:

Table 1. Survival Rates

Year / Item	1 year	5 years	10 years	15 years
Rate	97%	92%	81%	66%

4. Risk Factors Related to Surgery

A. Condition-related risk factors for mortality of the surgery:

1) Age: _____years: >70-80 years: 3.36%-8.31%
2) Sex: ☐M ☐F (Risk factor for coronary artery disease: Men >45 years, Women >55 years)
3) Cerebrovascular disease: (stroke history) 4) Smoking
5) Diabetes 6) Obesity
7) Kidney failure 8) Hypertension
9) Hyperlipidemia 10) Acute myocardial infarction
11) Chronic obstructive pulmonary disease 12) Left ventricular ejection fraction_____%
13) Preoperative cardiogenic shock 14) Preoperative use of an inotropic agent
15) Preoperative cardiac catheterization and post-procedure emergency surgery
16) Preoperative liver dysfunction
17) Previous coronary artery bypass surgery 18) Emergency surgery
19) Left main coronary artery disease 20) Left ventricular dysfunction

B. Other surgeries to be performed with this one: Multiple surgeries increase risks and mortality

1) Valve surgery: ☐Yes ☐No
2) Left ventricular aneurysm surgery: ☐Yes ☐No
3) Aortic surgery: ☐Yes ☐No
4) Other surgery: ☐Yes ☐No

C. Coronary artery disease: ☐1 vessel ☐2 vessels ☐3 vessels

D. This is your ☐first ☐second ☐third ☐fourth ☐fifth surgery

1) Previous surgeries: _____

E. Other surgery-related complications: Complications and mortalities as reported in domestic and international literature are as follows:

1) Direct cardiac-related death: 15-55%
2) Heart failure and low cardiac output: 7-40%.

   If occurring: Treated with inotropic support, intra-aortic balloon pump, extracorporeal membrane oxygenation (ECMO), ventricular assist devices, or heart transplantation. Post-event mortality is 48%.
3) Acute myocardial infarction: 2%

   If occurring: Treated with vasodilators, inotropic agents, or other medications. Intra-aortic balloon pump, extracorporeal membrane oxygenation (ECMO), ventricular assist devices, or heart transplantation may be required. Post-event mortality is 31%.
4) Post-surgery bleeding: 5-10%.

   If occurring: Blood transfusion. The condition may lead to shock that causes hypoxic brain injury, and the patient may even fall in a coma and a vegetative state. It may require additional surgery for debridement and bleeding control. Mortality rate from severe bleeding is 14%.
5) Arrhythmias: 0.7-35%.

   If occurring: Treated with anti-arrhythmic medications, defibrillation with AED, or the implantation of a permanent pacemaker.
6) Hypertension: Managed with medication.
7) Respiratory failure: 5%.

   If occurring: Mechanical ventilation or a repeat endotracheal intubation, or even tracheostomy, with a post-event mortality rate of up to 25%.
8) Kidney failure: 1.4-7.7%.

   If occurring: Supported with medications. Hemodialysis (kidney dialysis) may be required. Mortality rate increases to 10%-90% after kidney failure.
9) Infections: Managed with medications. The infection source needs to be identified as treatment target.
   a. Pneumonia or atelectasis: 60-84%.

      If occurring: Respiratory care interventions, breathing exercises, a repeat endotracheal intubation, antibiotics, mechanical ventilation, or even tracheotomy.

b. Urinary tract infections: 4%.
   If occurring: Antibiotics or removal/replacement of the urinary catheter.
c. Bacteremia: 6.8%.
   If occurring: Antibiotic treatment, tracking the infection source, and bacterial culture.
d. Chest wound infections and other complications of wound infections: 1%-4%.
   If occurring: May require multiple debridement surgeries, drainage, or muscle flap transplantation. Mortality rate is 10%, and hospitalization may be prolonged.
e. Infective endocarditis: 1%-2%.
   If occurring: Requires antibiotic treatment or repeat open-heart surgery. Mortality rate is 25%, with prolonged hospitalization and delayed discharge.
f. Cerebrovascular disease (stroke or brain hemorrhage) or hypoxic brain injury: 5%-10%.
   If occurring: Treated with medications, rehabilitation, and in some cases, cranial surgery. Potential sequelae include blindness, hemiplegia, hearing loss, or becoming a vegetative state, with a mortality rate rising to 28%.
g. Phrenic nerve injury: 1.7%-11%.
   If occurring: Can lead to incomplete lung expansion, pneumonia, or respiratory failure, delaying extubation, and may require tracheotomy.
h. Other neurological injuries: such as brachial plexus paralysis, spinal nerve paralysis, and vocal cord paralysis, accounting for 3%-7.6%.
   If occurring: Treated with medications and rehabilitation. Possible sequelae include hoarseness, lower limb disabilities, and incontinence.
i. Mental disturbances: such as amnesia, delirium, hallucination, paranoia, and ICU syndrome, accounting for 41%-70%.
   If occurring: Requires medication or psychiatric treatment.
j. Gastrointestinal issues: 0.3%-1.4%. Include peptic ulcers or bleeding, intestinal obstruction, rupture, ischemia, cholecystitis, pancreatitis, etc.
   If occurring: Treated with medications, may require blood transfusion, surgery, or drainage procedures. If the above complications occur, the mortality rate increases to between 11% and 59%.
k. Liver dysfunction or failure: 20%-50%.
   If occurring: Treated with medications, but severe jaundice, hepatic coma, or even death may happen during treatment.
l. Pancreatitis: 0.1%-0.6%.
   If occurring: Treated with medications, fluid infusion, even surgery. Death may occur in severe cases.
m. Endocrine disorders: Such as hyperglycemia, hypoglycemia, hypothyroidism, and adrenal insufficiency.
   If occurring: Treated with medication. In severe cases, coma or death may result.

n. Pericardial tamponade, delayed pericardial effusion, pleural effusion, abdominal effusion, possibly leading to hypoxic brain injury due to shock or heart failure; in severe cases, death may occur.

   If occurring: Treated with medications, fluid infusion, catheter drainage, and potentially repeat surgery.

o. Other sporadic complications: Such as aortic dissection, intra-abdominal vessel (mesenteric artery) embolism, peripheral vascular occlusion, etc.

   If occurring: Treated with medications, fluid infusion, surgery, or in some cases, amputation. Death may result.

p. Blood transfusion required during or after surgery: May cause allergic reactions, infections, kidney failure, liver failure, and in severe cases, death, among other transfusion-related complications.

q. Other unrelated diseases to coronary artery surgery: Such as cold and appendicitis.

   If occurring: Treated with medications, fluid infusion, or surgery, and in severe cases, may result in death.

r. Postoperative angina is described in Table 2

Table 2. Postoperative Angina

Year / Item	1 year	5 years	10 years	15 years	20 years
Angina	3.8%	4.4%	7.6%	11%	14%

Alternative options:

1. Below are the alternatives to this surgery or procedure. If you decide not to undergo this surgery or procedure, you may be at risk. Please talk to your doctor about your decision.)
2. The alternative options for this surgery include medication and catheter-based treatments, but they are less effective.
3. You may seek a second opinion from cardiovascular specialists of other medical centers, primary care doctor or medical websites.

Post-surgical care:

1. Before and after surgery, a doctor, specialist nurse, or nurse will explain the treatment plan.
2. Before discharge, a specialized nurse and a general nurse will guide you through post-surgery care instructions and follow-up. You will also be provided with educational materials or leaflets for reference. Please don't worry; we are available for consultation during business hours via phone.

Supplementary doctor instructions: (including responses to your questions)

1. After the surgery, you may experience coughing, wound pain, rib pain on one side or both sides, shoulder pain, or back pain, which typically wears off with time.
2. Scarring is expected post-surgery, and the size and texture will vary by individual. Crab foot swelling may occur.
3. You may feel thirsty, have insomnia, or experience palpitations, which should resolve over time, though medication may be needed.
4. If you wish to know about complications not mentioned here or any relevant medical information, feel free to ask the attending physician or medical team.
5. References and literature:

6.5.1 Sabiston & Spencer. Surgery of the chest 6th ed.1995.

6.5.2 Kirklin/barratt-boyes. Cardiac surgery 2nd ed.1993.

6.5.3 Seminars in Thoracic and Cardiovascular Surgery Vo1:3. No: 1.Postoperative Care of Cardiothoracic Surgery Patients.

6.5.4 Cardiac Surgery in the Adult, Second Edition 2003.

6.5.5 Cardiac Surgery. Safeguards and Pitfalls in Operative Technique. Third Edition.

6.5.6 European System for Cardiac Operative Risk Evaluation(Euro SCORE) I, II

The patient/patient family fully understands and is willing to participate in shared decision making (SDM), and agrees to undergo the surgery as described above.

Patient or family: **Relationship:**

Date: **MM** **DD** **YYYY**