

Cardiac Surgery Postoperative Rehabilitation Exercise Guidance

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■ Purpose

To provide cardiac surgery patients with principles of postoperative rehabilitation exercise guidance during the first stage (hospitalization). The main objectives of cardiac rehabilitation during hospitalization are :

- Stabilizing the patient's condition to prevent or treat complications.
- Reducing the harm caused by patient inactivity.
- Assisting patients in understanding the prognosis to reduce anxiety.
- Enhancing pre-discharge activity capabilities to enable patients to handle daily life requirements.

■ Content

- Postoperative Intensive Care Unit (ICU) Day One :
 - ◆ Limb joint exercises in bed, with emphasis on ankle movement. ◦
 - ◆ Semi-sitting position in bed; if the endotracheal tube has been removed, practice breathing exercises with a respiratory training device. Cough out phlegm when present (cover the incision with both hands while coughing). Physical therapists will assess the need for chest percussion.
- Postoperative ICU Days Two, Three, Four, and Five :
 - ◆ Limb joint exercises in bed, with emphasis on ankle movement.
 - ◆ Semi-sitting position in bed; practice breathing exercises with a respiratory training device. Cough out phlegm when present (cover the incision with both hands while coughing). Physical therapists will assess the need for chest percussion.

■ Postoperative General Ward Day One :

- ◆ Standing limb joint exercises and stretching; walking (up to 20 meters at a time).
- ◆ If poor posture such as stooping occurs, perform "cane exercises."
- ◆ Maximum pulse rate per minute $<$ (resting pulse rate per minute + 20 beats per minute) or (120 beats per minute). Measure the pulse rate by counting for 15 seconds and multiplying by 4.
- ◆ Activities in the ward such as using the restroom, washing up, sitting in a chair, etc., are encouraged. Practice breathing exercises with a respiratory training device. Cough out phlegm when present (cover the incision with both hands while coughing).

■ Postoperative General Ward Day Two :

- ◆ Standing limb joint exercises and stretching; walking (up to 100 meters at a time).
- ◆ If poor posture such as stooping occurs, perform "cane exercises."

- ◆ Maximum pulse rate per minute $< (\text{resting pulse rate per minute} + 20 \text{ beats per minute})$ or (120 beats per minute).
- ◆ Activities inside and outside the ward such as using the restroom, washing up, sitting in a chair, walking (but no stairs). Practice breathing exercises with a respiratory training device. Cough out phlegm when present (cover the incision with both hands while coughing).

■ Postoperative General Ward Day Three :

- ◆ Standing limb joint exercises and stretching; walking (up to 150 meters at a time); under the supervision of a physical therapist, go up and down at least one floor.
- ◆ Maximum pulse rate per minute $< (\text{resting pulse rate per minute} + 20 \text{ beats per minute})$ or (120 beats per minute).
- ◆ Activities inside and outside the ward such as using the restroom, washing up, sitting in a chair, walking

are encouraged. Practice breathing exercises with a respiratory training device. Cough out phlegm when present (cover the incision with both hands while coughing).

■ Postoperative General Ward Day Four :

- ◆ Standing limb joint exercises and stretching; walking (up to 150 meters at a time); under the supervision of a physical therapist, go up and down at least two floors.
- ◆ Maximum pulse rate per minute $<$ (resting pulse rate per minute + 20 beats per minute) or (120 beats per minute).
- ◆ Activities inside and outside the ward such as using the restroom, washing up, sitting in a chair, walking are encouraged. Practice breathing exercises with a respiratory training device. Cough out phlegm when present (cover the incision with both hands while coughing).

■ Physical therapist's reminder

Postoperatively, due to the effects of anesthesia, there is an increase in respiratory secretions. In the presence of pre-existing history of chronic obstructive pulmonary diseases (such as chronic bronchitis, chronic bronchiolitis, asthma, emphysema, cystic fibrosis), preoperative respiratory conditions, reluctance to engage in deep breathing or coughing due to incisional pain, or a history of smoking (regardless of current smoking status), there is a possibility of mucus accumulation deep within the lungs, making it difficult to expel.

In the intensive care unit (ICU), a physical therapist will assess clinical conditions and provide appropriate chest physical therapy, such as chest percussion, postural drainage, and teaching you to use a respiratory training device. Techniques like securing the incision while coughing (using a pillow to apply pressure on the incision) may also be taught to aid in

clearing accumulated mucus. These interventions help prevent respiratory complications.

In a general ward setting, family members or caregivers may be instructed by the physical therapist to perform these treatments for you. If necessary, these measures may need to be continued after discharge to ensure ongoing respiratory care.

■ Breathing Training Device

The purpose of practicing with a breathing training device is to increase your inhalation volume, expand the chest to enhance blood oxygen concentration, promote the expulsion of phlegm, and accelerate the removal or absorption of excessive pleural fluid. When using the device, exhale completely before inhaling through the mouthpiece



of the training device. In each set of five inhalations, take a break with three to five breaths of normal depth to avoid excessive ventilation, inadequate cardiac blood output and reflux, which may lead to dizziness and discomfort.

The number of repetitions in a single practice session does not need to be excessive, but it is advisable to practice several times a day, and it is best to continue practicing after being discharged and returning home. If you are unfamiliar with using a breathing training device, an alternative method is to gently blow on a tissue, allowing it to float for as long as possible. For children, methods such as blowing a pinwheel or a paper frog can be used as substitutes. The practice methods and precautions are the same.

■ Precautions

- Within three months after surgery, it is advised not to lift heavy objects or perform chest-expanding movements to avoid affecting the healing of bones and tissues.
- If dizziness, difficulty breathing, confusion, unsteady gait, angina, or other discomfort symptoms occur during exercise, or if there is a situation where the heart rate and blood pressure drop instead of rising, it is necessary to immediately stop exercising and seek prompt attention.
- If on a given day, the body feels unwell or vital signs such as body temperature, pulse, and respiration are unstable, it is recommended not to force oneself to exercise to prevent accidents.

■ Home Activity Plan

- Perform limb joint exercises at least once every day.
- Continue practicing with the respiratory training device.
- For those with persistent coughing, perform chest percussion and postural drainage upon waking up and before bedtime each day.
- The most suitable exercises are "walking" and "gentle exercises," but be cautious not to let the pulse rate rise during exercise by more than "20 beats per minute above the resting rate" or "exceeding 120 beats per minute."
- Avoid lifting heavy objects or performing chest-expanding movements.
- Daily activities and movements should not be too strenuous. Engage in static work or simple household tasks that do not involve lifting heavy objects.
- This home-based activity plan is suitable for the first 12 weeks after surgery. After stabilizing the condition, a second phase of cardiac rehabilitation may be

needed. Please inquire about the details during your follow-up appointments with the physician.

The information provided is for reference only. Please discuss your clinical status with your physician or physical therapist.

If you have any questions, please contact

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